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# CONTENTS



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## *MISSION STATEMENT*

### Council for Learning Disabilities

The Council for Learning Disabilities (CLD) is an international organization that promotes effective teaching and research. CLD is composed of professionals who represent diverse disciplines and who are committed to enhance the education and lifespan development of individuals with learning disabilities. CLD establishes standards of excellence and promotes innovative strategies for research and practice through interdisciplinary collegiality, collaboration, and advocacy.

# STAGES OF ACCEPTANCE OF A LEARNING DISABILITY: THE IMPACT OF LABELING

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***Abstract*. The research described here is part of a 20-year longitudinal project tracing the lives of a group of 41 individuals with learning disabilities. The article enumerates a small piece of the qualitative findings obtained using an ethnographic approach that emphasized the "emic," or insider's, perspective. Since several of the research questions addressed patterns of change over time, portions of the interview focused on changes in past and present attitudes, emotions, conceptions and meanings related to the learning disability. A salient notion emerged from participants' narratives, which they described as "acceptance of the learning disability." Further analysis revealed a shared set of understandings concerning distinct stages of "coming to terms" with the technical realities of their disability and with the social/emotional impact of being labeled. These included (a) awareness of their "differentness"; (b) the labeling event; (c) understanding/negotiating the label; (d) compartmentalization; and (e) transformation.**

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This article was developed from data gathered in a 20-year longitudinal study of 41 students with learning disabilities (LD) who as children had attended The Frostig Center. The overall purpose of the study was to understand as fully as possible and describe the common "life-span experiences" of our students so that generalizations, implications, and recommendations could be made for all persons with LD. One aspect of the study involved obtaining quantitative findings to determine predictors of success. These have been reported elsewhere (Raskind, Goldberg, Higgins, & Herman, 1999). To a large extent, the quantitative analysis required that each participant be "reduced" to a collection of characteristics or traits, to scores on IQ or achievement tests, to incidences of job changes, and to "average" income.

The overall purpose of the investigation, to describe the "life-span" experiences of persons with LD, cannot be achieved completely using a quantitative approach alone. At a minimum, there must be a treatment of participants as "whole persons." Research strategies for studying whole persons focus on symbolic, shared systems, study persons one at a time, and regard participants as "expert" consultants (Heinemann & Shontz, 1983). Beyond methodology, as Bos and Richardson (1994) pointed out, the very nature of the phenomenon

studied with quantitative and qualitative research differs. These authors evoked Dabbs' (1982) comments, "Quality is the essential character or nature of something; quantity is the amount ... Qualitative refers to the *meaning* ... while quantitative assumes the meaning and refers to a measure of it" (p. 13, emphasis added). Similarly, Wolcott (1985) pointed out that the ultimate outcome of qualitative research (ethnography) is to describe the *sense of meaning that researchers have made* of what has been investigated; is a description of what has been observed, "*plus* something special in the nature of interpretive emphasis" (Wolcott, 1992, p. 21).

Although in agreement on the importance of the meaning derived by researchers, Spradley (1980) suggested that the "making" of *meaning* out of ethnographic information is the description and understanding of a culture *from a native or insider's point of view*. That is, what begins as mere inference made by the researcher must be verified over and over in various contexts with various insiders before a shared understanding is assumed.[1] He suggested that informants[2] review analyses (Spradley, 1979), as have other researchers dealing more specifically with educational settings (Goetz & LeCompte, 1984; Schon, 1991) or researchers specifically investigating persons with LD, such as Bos and Richardson (1994), Hellendoorn and Ruijssenaars (1998), or Reiff, Gerber, and Ginsberg (1997).

Spradley referred to the search for the insider's point of view as the "emic" perspective; the "etic" perspective, on the other hand, describes the culture from the point of view of the researcher or from the frame of reference of the researcher's culture. Similarly, Smith (1987) made reference to the emic/etic dichotomy as it applies to research in educational settings. In the field of LD, Reiff et al. (1997), Gerber and Reiff (1991), and Gerber et al. (1990) are examples of researchers who have employed an emic perspective to elicit accounts from informants with LD "in their own words."

In addition, the larger 20-year investigation was aimed at acquiring knowledge on what McKinney (1994) called the "natural history" of LD and to search for patterns of change over time. Therefore, portions of the interview were devoted entirely to questions concerning changes in past and present attitudes, emotions, conceptions and meanings, especially those related to the LD.

A salient notion for both researchers and participants emerged as an important subject of study early on, the development of "acceptance of the learning disability." Hence specific questions in the interview addressed the concept. Klass (1981) explored the development of "acceptance" (of death and other hardship) as a kind of symbol with a long history of associations and meanings in the American system of beliefs. He used Kubler-Ross' (1969) stages of grief (upon learning one's illness is terminal) as an example of a current theory arising out of a pre-existing category. The last stage (or goal of the process) is acceptance. He placed "acceptance" more generally in the American culture and symbolic system as part of a larger, "private sphere" of symbols (as opposed to the public sphere), associated with domestic (and feminine) concerns. Klass pointed out that the notion of "stages of acceptance" has been extended to many phenomena and been popularized widely so that the stages are now incorporated fully into the American belief system.

Because the notion of acceptance has been applied to so many types of phenomena, it is important to point out that both Klass and the present authors are referring to *self*-acceptance, rather than to the (social) acceptance of a person with a condition by others. Acceptance of a child with an LD by others *with* the condition, as well as by teachers and by nondisabled peers, has been addressed specifically in several studies (Barga, 1993; Foster, Schmidt, & Sabatino, 1976; Guindon, 1993; Hanson, 1997; Kuther, 1994; Renick, 1985; Rolison & Medway, 1985).

To summarize, the present article attempts to utilize the emic perspective within a longitudinal design to capture from our participants their own descriptive language, categories, and organization of the concept of "acceptance" of their LD. The data upon which the researchers have based the following account were gathered in the context of a larger 20-year longitudinal study that included both qualitative and quantitative analysis. The specifics of the methodology employed in the larger study follow.

## METHOD

### Participants

For the 10-year followup study (Spekman, Goldberg, & Herman, 1992), questionnaires were sent to the parents of 206 former students of The Frostig Center who had been diagnosed with an LD and had attended the school for at least one year. Of the 206, 89 parent responses were received; 50 former students agreed to a more lengthy interview and were also assessed as to current achievement and IQ measures.[3] The final 50 students were compared to the original 206 previous students as to socioeconomic status, age, gender ratio, ethnicity, verbal, performance and full scale IQ, achievement discrepancies, and original diagnosis. No significant differences were found along any of the measures. At the conclusion of the 10-year followup, approximately half of the individuals were rated as "successful" and half as "unsuccessful" based on clinical summaries of interviews, job and educational status, current testing, and questionnaire data. Criteria for the ratings were

based broadly on employment, educational, familial, social, and psychological adjustment criteria.

At the 20-year followup, researchers were able to reach 47 of the 50 students from Year 10. Of these, enough information was obtained from 41 to allow a rating of successful/unsuccessful. Extensive, direct interviews were conducted, which lasted from 4 to 6 hours and included specific questions concerning financial status, employment history, residence history, family relations, community relations, physical health, recreation, criminal contacts, drug and alcohol use, and a wide range of personal/psychological attitudes and behaviors. Databases were established for quantitative data, and transcripts were prepared of the interviews.

Other data included current achievement and IQ testing scores, additional cumulative file information, life stressor checklists completed by each participant, researchers' current ratings of success, researchers' ratings of each participant for the presence or absence of six success attributes (discussed below). For comparison and verification of information, public sources were consulted such as voter registration, criminal and civil court records, and so on.

The raw data for the current article for the most part were taken from transcripts of individual interviews conducted during the 20-year followup when participants were in their mid-thirties. The researchers began with the 10-year followup interview questionnaire that had been used to formulate the clinical summaries. Over several months the researchers met to revise and refine questions, and to formulate new ones that arose out of previous analyses, or reflected current research interests in the field of LD. Members of the research team, composed of an anthropological linguist, a developmental psychologist, a specialist in LD and a clinical psychologist, had each been working in the LD field for over 15 years.

During the development of the protocol questionnaire, constant contact was maintained with children and adolescents with LD currently at The Frostig Center. In addition, all the researchers had developed many relationships, both professional and private, with adults with LD. Questions and research strategies were refined continuously and elaborated according to feedback elicited from these LD persons. Consequently, our cumulative involvement with the LD community was wide, rich and historical, as well as current, reaching far beyond the 50 participants in the study.

### Data Analysis

During the interviewing of the participants, the research team conferred on a weekly basis to refine interview techniques, strategies, and study questions, as well as to develop tentative trends, commonalities, and themes. The taped interviews were transcribed and distributed. Weekly meetings continued to begin formal analysis of the transcripts and protocols. Typically, on the first discussion of a transcript, the researcher who had interviewed the participant would describe briefly the physical conditions of the interview (e.g., where it had taken place, distractions, etc.) and any difficulties that had arisen. For the quantitative analysis,[4] rating sheets had been prepared that included overall success ratings as well as ratings on individual domains including employment, education, independent living, family relations, community involvements, crime/substance abuse, and physical and mental health. After all transcripts had been reviewed, group assignment was made into successful and unsuccessful participants, and domain ratings were collected and analyzed.

As the quantitative analysis progressed, the findings from Year 10 were further developed; specifically, a set of success attributes were refined that were identified as being highly characteristic of the successful participants. For the 20-year followup, these were operationalized and further quantified. Each participant was rated for the presence or absence of designated behaviors or attitudes characteristic of each attribute. For example, Appropriate Goal Setting and Self-Directedness was one of the original Success Attributes from Year 10. In Year 20, Goal Setting was operationalized as the following: participant (a) refers to current goals; (b) gives evidence of past and future planning; ... (f) expressed interest in developing a sense of meaning to his/her life (see Appendix A of the 1999 article for a complete listing of the Success Attributes). As expected, successful participants showed many if not all the behaviors and attitudes identified in the six Success Attributes, while unsuccessful individuals showed significantly fewer.

After the quantitative analysis, all transcripts were again read to identify prevalent qualitative themes. The success attributes again emerged as important concepts for our participants (all qualitative themes are currently being further developed for reporting in a later paper). One of the success attributes in particular was salient to both participants and researchers—acceptance of the LD, the subject of the current article.[5] It had originally been defined in Year 10 as a part of another success attribute, Self-Awareness, which was operationalized in Year 20 as follows:

Self-Awareness

a. Acceptance of the LD
    1. participant refers to him/herself as learning disabled;
    2. participant describes events in terms of his/her LD;

3. participant compartmentalizes the LD, seeing it as only one aspect of him/herself, rather than being defined entirely by it.

b. General self-awareness
   1. participant refers to his/her individual strengths and/or weaknesses;
   2. participant refers to his/her individual behavior patterns, "hang-ups", etc., apart from the LD

How was it that the successful individuals came to believe and behave as they did, while the unsuccessful did not acquire these attributes? Were there differences in rate of acquisition? In participants who possessed them, did they spring full-blown or develop over time? Do participants discuss a stage-like process? These were but a few of the questions the researchers hoped would be answered with information from the lengthy interviews.

### Validity of Results

In preparing this manuscript, the authors grappled with the issue of what it was they were trying to describe with the "stages of acceptance of the learning disability." Was it overt behaviors that occurred in a particular order? Was it a semantic reduction or summary of what participants actually had said during their interviews? Or was it an explanatory theory derived by the researchers of what the *meaning* is, *to the informants*, of "stages of acceptance of the learning disability" (which could later be "tested" or corroborated by the transcripts of individuals)? It was important to make such a determination so the researchers could identify data that would provide convincing evidence of the existence of the phenomenon and its prevalence. For example, if one were trying to develop a theory concerning overt behavior (perhaps for predictive purposes), evidence of what informants *said* would not be as convincing as actual *observations* of the participant's behavior. If a summary of the descriptive terms associated with "acceptance" were the target of the study, then a summary of the *range and frequency of particular words* used in the interviews when asked about "acceptance of the learning disability" would be appropriate. But if the discovery of the shared meaning of a concept is the object of pursuit, then the totality of contexts and language surrounding the phenomenon must be examined, and a hypothesis generated concerning the meaning of it. Finally, a confirmation of its accuracy must be obtained by asking the participants themselves.

As appropriate, partial confirmation of the accuracy of the meaning of "acceptance of the learning disability" will be presented in the form of direct and relevant quotes below, chosen from the corpus of the interviews, as appropriate. Further, during the development of the analysis that follows, networks of past and present LD contacts were consulted regularly and their feedback utilized in fine-tuning the concepts and stages. In addition, the researchers submitted drafts of the theory concerning their beliefs directly to participants after the major components of this manuscript had been drafted. Four informants were contacted for general responses to a draft of this manuscript which was read to them. Their oral responses were then transcribed. (See the Appendix for two examples of the transcribed responses from participants.)

## RESULTS

As mentioned, participants had a great deal to say about the acceptance of their learning disability. Toward the end of the interview specific questions were asked concerning "coming to terms" with their LD; however, several participants voluntarily brought up the subject themselves prior to this direct probe.

> I think I accept it. It's a pain but I mean there's nothing I can do about it. Other than try to learn more and learn ways to not show it or get around it using the computer or whatever it is. Notes to my girlfriend, writing them out on the computer first then writing them down. That's a way of coping with it.

> My acceptance of it happened when I was in junior high looking at high school. That's when I finally said, "This is the way I am." Then I dealt with it.

> I pretty much accepted it from the very beginning. Other people had a hard time with it and nowadays everybody seems to accept it. Nothing much you can do about it. Some people try and say, "Well you should change it. You should work at it." We work as hard as we can.

> I've learned to cope with it much better. I have at my disposal some technology that I didn't have back then. I coped around it. I made up my own mind.

Many described coming to terms with their LD as occurring over time, some indicating passage through various "stages" of acceptance over their lives so far.

> But then when I was at the Orton Meetings [now The International Dyslexia Association] I would meet these people who had the same problems as I did. And I would see them at different stages. And I've already been through all those things.

> That stress thing there is like you know when you're a kid, yeah it's a thousand percent stressful. Because you are striving to learn something you didn't know before. And as an adolescent, yeah, yes. I had the training to teach me how to do it and everything but it was still a major portion of my life. I was still trying to achieve in school. So it was still a major stress. But not as major as when I was a little kid. Difference in attitude. And when I became an adult I just looked at myself totally differently. It was not any problem at all.

"Acceptance" (of disability or other hardship) as a symbol (or therapeutic goal?) has been discussed in many contexts by many authors, most notably by Kubler-Ross (1969), who described the stages of acceptance of one's own death: denial, anger, bargaining, depression, and acceptance. In the field of disabilities, many authors have discussed acceptance as a general symbol of psychological or personal adjustment, and a few have extended or modified the stages suggested by Kubler-Ross to encompass acceptance of a "handicapping" condition. For example, Higgins (1980) discussed the acceptance of deafness by deaf individuals. Livneh and Antonak (1991), and Livneh and Evans (1984) described a stage-like process of adjusting to physical disability (working from earlier process models by Cohn [1961], and Fink [1967]). Icabone and Galley (1982) reported on the acceptance of mental retardation by students with mental retardation, whereas the acceptance of disability by the parents of a child with disabilities has been described by Martin and Nivens (1980), by Witcher (1987, 1989), and by Rundall and Smith (1990). Acceptance of a grandchild's disabling condition by grandparents was investigated by Murphy and Della Corte (1990). Even the acceptance of the experience of incarceration by criminals and their families has been investigated (Pledger, 1985). Finally, with respect to LD, Reiff et al. (1997) described a process of coming to terms with an LD they call "reframing," which includes as one of its four stages "acceptance." Reframing "... is a set of decisions related to reinterpreting the LD experience from something dysfunctional to something functional" (p. 105).

As the participants discussed having an LD, less attention was given to the actual disability than the researchers had expected, (i.e., being unable to spell common words, for example, or decode road signs quickly). These were often minimized, or portrayed as mere annoyances. Many participants mentioned that they had long ago found ways to compensate for, or work around, the situations in which the actual disability came up. A similar phenomenon has been noted by other researchers. For example, Higgins (1980) referred to a kind of institutionalized joking about their "handicap" among the deaf. In fact, a national newspaper for the deaf contains a column entitled "The Hazards of Being Deaf," which is about nonthreatening, humorous, or absurd situations the deaf must endure because they are forced to live among and communicate with hearing folk (p. 87). A similar minimizing of the disability through the use of humor was also evident in some of the transcripts of our informants:

> I have accepted it to the point where I can be humorous about it.

> And they always laugh at me because there are people there that have much more experience in certain types of counseling than I do, such as working with gang clients or working with battering situations and some of these people do not have licenses and I always ask them questions and they look at me and say, "Well, you're licensed. Don't you know?" Just 'cause I have a license does that mean I can't ask questions or I shouldn't ask questions? So they laugh at me, and that I like, the open team work situation there.

However, as Higgins (1980) pointed out, there is no joking on real issues of concern for the deaf, such as the denial of rights and privileges through stigmatization by the larger culture.[6] Our participants showed a similar partitioning of the day-to-day technical problems of the disability from the stigma attached to it by their culture, often responding with intense anger or sadness to being stigmatized:[7]

> No. I didn't understand it exactly. Not then, but later I felt bad because of teasing, just being different. Going to a special school, they call you names. I knew I was different and that made me feel bad.

> I think as I indicated to you, the most difficult time was fourth through eighth grade because the kids made fun of me.

> Your peers call you stupid and retarded. They make fun of you. You don't feel good about who you are. Your self-esteem goes down. You think of yourself as a stupid child. Because that's what everybody's projecting onto you. So there are more disadvantages to having the learning disability than there are advantages.

The stages of "acceptance" of their LD, then, as described below by our informants, involve more than merely coming to terms with the technical realities of a

disability. Rather, it is coming to terms as well with the social/emotional impact of being labeled. Although the stages themselves have been well described by the informants, the authors have supplied names for them. Hence, they do not necessarily reflect the terms used by informants. The stages to be discussed include: (a) a period of awareness of their "differentness," (b) the labeling event, (c) a period of accumulating an understanding of the limiting nature of their disability and of *negotiation* with service providers for assistance, which eventually leads to (d) *compartmentalization* of the LD, and finally, in some cases, to (e) a *transformation* of their negative attitude toward their disability into an appreciation of the positive influence it has had on their lives and character.

The organization of the stages along a timeline is dictated somewhat by the logic of the situation. For instance, understanding the limiting nature of the disability must precede compartmentalization. No attempt has been made beyond logically arranging the periods, however, to verify the order of stages. As mentioned, Reiff and colleagues (1997) also posited stages for what they have termed "reframing," which includes acceptance of the LD. They suggest, "Some [highly successful adults with LD] moved through the stages almost in unison while others systematically moved from one to the next" (p. 106). The present authors have not investigated the speed or simultaneity of occurrence of the stages, nor do they make any claims concerning participants' passage through them. Each stage is now discussed in more detail below.

### Stage One: Awareness of a Difference

All participants described a time when, although the problem had not yet been pinpointed, they were aware of being different from other children.

> I knew I was a little slower but I never really thought of it as a disability because I could always do whatever I wanted to do.

> My parents knew something was wrong but they just, you know, the teachers would tell them that I wasn't trying and was a bad student and didn't have enough supervision and discipline at home.

> I had a hard time when I was a child because I remember when I went to city schools I had this teacher that made me stand in front of the class and tell me, "C__ just isn't trying. He's not a go-getter. He doesn't try." And I remember her writing notes and stuff to my mother and going home. It was a horrible experience as a kid. Just a terrible experience.

**Academic differences.** Some described being different in terms of general academic progress or in specific subjects (reading, writing).

> [I] was not able to read or form sounds.

> I definitely wasn't reading with the class and I certainly couldn't do the spelling so I was way behind people in that regard and I think that's when my parents got concerned in second grade and started having me tested for various things.

> I wasn't a behavior problem, I didn't have an attention problem. "But Jes ... he just can't learn his reading and writing. There's a little something wrong, just give me another year."

**Academic-related differences.** Several participants described academically related problems (attention, organization) *in addition* to their academic problems.

> Reading wasn't up to snuff ... Math wasn't up to snuff ... I have attention deficit disorder.

On the other hand, a few participants characterized their "differentness" *entirely* in terms of academically related problems.

> [Interviewer: What problems brought you to Frostig?] Participant: Concentration, hyperactive.

> I may have had learning disabilities. I think it was just a matter of getting me to focus my attention on the subject and not give up. Learn some tenacity. I think that was my learning problem.

**Nonacademic differences.** Nonacademic difficulties were also mentioned by most subjects, such as physical deficits (e.g., poor coordination), or social, behavioral or emotional problems. Most informants described their nonacademic difficulties as *accompanying* their LD.

> Academically I was failing. I had poor eye coordination. And I had a bad temper, a real bad temper. That was accelerated after the death of my father. That was the main issues [sic].

> Inability at math and maybe not getting along with children very well.

> Mathematics and motor coordination skills. I couldn't do things. I mean I couldn't catch a ball until I was about 11 years old. I just couldn't figure out how it was coming or where it was coming

from. It was a real problem. I had to have some physical therapy. It was a physical thing, something physically wrong with my brain.

But a few characterized their "differentness" *entirely* as nonacademic in nature.

I think it was mainly social problems. Doing what you're told to do. Disturbing the class. Not following instructions. Not being able to concentrate, that kind of stuff.

It [an LD] was just something that I had that they came up with that had to be dealt with at some point from the problems I was having in elementary school, maybe even before. In nursery school or primary school, I remember ... I had problems with discipline ... And I just remember that I wasn't an above-average student. I was more of an average student. I think I had one or two low grades at some point. I went on to elementary school for a couple of years and I had problems with the teacher, particularly this one teacher. Then I had this other teacher the following year, and I think I still had learning problems in reference to acquiring information like everybody else without having to take more time with me so I could learn what I acquire through reading a book and following directions and all that.

**Normative value judgments.** However informants may have felt themselves to be different, there was an additional acknowledgment, as illustrated in many of the passages above, that the larger culture or society was negatively judging them (i.e., along a normal-abnormal, good-bad continuum—they definitely were not normal, and not good).

I think it's something that was so hard, it was so ingrained in me it's hard for me not to feel slower than the other children, right. [Interviewer: Still?] Participant: Right.

Everybody else noticed that I was dumber than everybody else. Interviewer: Wasn't reading is what you ? ... M: That's not how I remember it. I remember they said dumb. Those are the memories that I have of childhood. That's why I don't look back ... I look at being an adult as being a lot greater ... A lot of people have said, "You don't look at childhood? Great." I was so glad to become an adult you can't believe it. First grade, really through high school.

It was me versus the normal people. And the normal people is everybody who doesn't have a disability, isn't dyslexic.

They want everybody to be the same. Normal, or what they think is normal. Learning disabilities I don't think is a comfortable subject. I have to go on explaining what it is to everybody. A lot of people don't like listening to your explanations. They want to believe what they want to believe.

I don't think I really believed I wasn't stupid 'til long long time after that. You're behind—everybody knows you're behind.

That's a very difficult question to answer in retrospect because it affects you in different ways. I mean emotionally, mentally and physically, it is an effect on you. You have behavior problems due to it. You have peer problems. You have the problems of the mental attitude about yourself and you have the physical problems of being able to read like everybody else does or being normal like everyone else is or considering yourself to be normal like everybody else is. So it makes it rather hard to specifically lay it down in terms of what it does to you, but I can tell you it does have a long-term effect on your life, for the rest of your life. Because it's how you view yourself for the rest of your life.

**Adaptive value judgments.** Some informants expressed participation in another type of value system apart from the normative one imposed by the culture, which they considered private or personal—an adaptive or survival-based value system. An informant could consider himself to be different from the norm (good/bad) in a particular way, yet value that trait positively along an adaptive value continuum (strong/weak) in relation to peers. For instance, an informant might comment that he had problems in school with being physically aggressive, but that the aggressiveness itself stood him in good stead relative to his classmates.

Kids at school would call me dummy. I would turn around and smack 'em [laughter]. But I had a very good social life—sort of lead the schoolground club.

I was just fine with being a rascal. That's why we have parents. Ask a car to fix itself. It isn't going to happen. That's why we have parents and they did the right thing.

I guess it's more my being self-conscious more than anything else. I mean you could put up with any of

this. At this point, all that stuff, teasing, changing schools, being held back a year, sounds so trivial because I could just tell them all to go to hell now. But I certainly didn't have that kind of fortitude when I was a child. That really hurt and I can still have nightmares where I remember stuff like this. I can almost still hear the names and stuff like that.

Some participants' transcripts also revealed an acknowledgment that the larger culture "cut them no slack" as to the expectation of a "normal" final outcome to their lives, regardless of the degree of disability they may experience, as may occur for more visible disabilities such as blindness.

> See, my mistake was pretending it wasn't there and trying to be part of the mainstream. I wasted a lot of time doing that. Yes, I guess the best way to put it is I've accepted it more than I used to. My parents and the jobs I worked for, too, seemed to want to act like it isn't there. But I know now that it is there. I expected too much of myself as far as being part of the mainstream, I think. I just tried to do everything the way everybody else did. I didn't ask for help. I was afraid to say anything so they would over ... think I couldn't do anything. I floated around for a long time. But now I believe I'm on track better. I have a better idea of what I can do, and what it all means, having a learning disability.

**Affective/behavioral domain.** As evidenced by many of the above comments, most informants expressed strong emotional feelings surrounding the issue of their differentness long before being identified as LD, including fear, confusion, frustration, and anger, and/or described behaviors that may have resulted from these feelings, such as withdrawal, crying, aggression, and so on.

> I was embarrassed and ashamed and ridiculed by other kids. It was not pleasant.

> The teacher had found it and so that is how I was placed in the school. I remember when I was told I had to go. It was tough. I was forced to go there. I remember screaming the first day I went there.

### Stage Two: The Labeling Event

Many informants describe not so much a single event, but a process whereby parents, doctors, teachers, and other adults were attempting to identify what was "wrong" with them. Events frequently included a general physical exam, referral to one or more specialists (allergist, nutritionist, neurologist), a trip to the optometrist to check for vision problems, and often psychological evaluation of emotional or behavioral problems. On the school front, there were referrals for assessment by speech/language therapists, school psychologists, reading specialists, etc., etc., etc.

Several labels might be applied to the participant over the period. Those mentioned by the informants include "nearsighted," "hard of hearing," "visual perceptual problems," "auditory sequencing deficit," "speech/language delayed," "emotionally disturbed," "schizophrenic," "obsessive/compulsive disorder," "underachiever," "remedial reader," "slow," "mentally retarded," "dyslexic," "attention-deficit disordered," "behavior problems," "troublemaker," "lazy" or "conduct disorder." Obviously, some of the terms have negative connotations, while others are more neutral. Some apply to academic difficulties (e.g., "underachiever"), others to academically related difficulties ("attention deficit") and/or nonacademic problems ("troublemaker").

The task to be accomplished by the informants during this stage, then, is not only to identify which labels actually reflect their difficulties, but also to reject the negative labels and settling on more neutral terms to describe them.

> Participant: I thought some the tests they were giving me were ... like some of the psychologist's stuff was bull. Interviewer: Like what? Participant: [laughter] "What do you see in this picture?" I've seen that test about 50 times. Just them trying to put ... They also did brain scanning and blood tests and stuff. I think they used to try to put it together with defects, when it wasn't. I don't they were really looking in the right spots.

> We went to all kinds of people. People thought it was my eyes, to all kind of people who came along. I think a lot of times people are looking for ... and certainly I think my parents wanted to look for an easy fix, too.

> I just always remember taking bloody tests. I remember I took a test and they asked, "Like what items are similar?" There was a lawnmower, a frying pan, like maybe some dirt. "Say what two have in common." I said, "Well the lawnmower. Both conducted electricity. Both made out of metal." I remember that. I remember going to a couple of different testing facilities. I went to this one place and they stuck all these things on me. I mean EKGs on me I don't know if it's one of the Frostig things. I think they were trying to find if there was some neurological damage.

**"Accurate" labeling.** It is important to point out that during the time that informants were undergoing this identification process, the formal definition (not to mention definitions in more general use such as "folk" or "street" definitions) of exactly what constitutes an LD was in constant flux, and continues to change to this day as federal and state legislation is enacted and local school districts attempt to develop policy concerning eligibility for services and benefits (Kauffman, Hallahan, & Lloyd, 1998; Kavale & Forness, 1998). To give the reader an idea of the range of variation in defining LD, Hammill (1990) rated agreement among the 11 most widely used definitions over the years on particular elements such as how underachievement is determined, whether there is reference to central nervous system involvement, whether the definition purports underlying psychological processes (e.g., visual organization, auditory discrimination, etc.), whether LD is described as continuing over the life span, whether language impairment is mentioned, whether academic difficulties are mentioned, whether disturbances in "thinking" are indicated, and whether multihandicaps are addressed. On none of these elements do the 11 definitions agree!

The diversity of opinion that has occurred across time and across geographic regions at any *given* time regarding the definition of learning disabilities has made it possible for informants and parents to "negotiate" to some extent the label they ultimately accept (other aspects of this negotiation process will be discussed again during Stage Three). However, whether an informant is "accurately" labeled can only be evaluated in terms of the fully described individual contexts and definitions under which each participant was identified.[8] Further, this diversity of opinion raises the possibility that at any particular point in time, an informant may or may not have qualified as having an LD under the reigning definition and/or school identification policy. In fact, several informants reported the actual experience of "having" an LD (qualifying) in one setting or at one point in time and "not having" an LD (not qualifying) in another.

> They called up a few universities and they called UCLA and they had me ... had a private tutor come in. The tutor said that I might have some kind of eye problem at first. So they took me to an eye doctor and the eye doctor said my eyes were fine. Then they took me out of military school and took me to a school called W___. That lady believed that whole learning thing was you're lazy. So they found that that didn't work, so they pulled me out of there and stuck me in UCLA for testing. I sat there for 12 months. Was diagnosed with a reading difficulty but that was about all the word was. Went and saw a lady across the street from UCLA. She was the first person to come along and tell my parents that your son has dyslexia. [After 4 years at Frostig] I also went to UCSD down in San Diego and I had a psychologist and a professor down there give me testing for about three weeks. They diagnosed the total opposite and said I didn't have any handicap problems and it was just laziness.
>
> As I was going to show you, this is the testing here which is only three years old. I had this at rehab and it is very interesting because I go from a 12 all the way down to a 1 on this. Look at this. So there are things, this was done only three years ago. One guy told me I don't have a disability, it's just the way I'm wired up. But that isn't right. This confirms that I have the disability and the state has acknowledged this.

When discussing the degree of "acceptance" (or denial) of one's LD, the question arises of whose definition of a learning disability to accept. The authors have opted for a discussion of "acceptance" or "denial" to be centered on the "folk" categories (descriptive terms) actually used by the informants (i.e., academic difficulties—reading, math, handwriting, academic related difficulties—concentration, organization, and nonacademic problems—behavior, emotional/social problems). In their own terms, the informants consider themselves as having an LD if, and only if, they have academic difficulties.

> [Interviewer: Do you think you have a learning disability?] Participant: You know I was diagnosed as dyslexic and it really got better as I got older but now work, you work with numbers all day long and style numbers and stuff like that at this job, and it's come back.
>
> [Interviewer: Do you think you have a learning disability?] Yes, but I think I've pretty much gotten over it. It's still there and I compensate for it by reading and my vocabulary, I'm always trying to expand upon that.
>
> I still think I do [have an LD]. It still takes me extra effort to sit down and read. Sometimes I have to read something two or three times.
>
> I don't think it's [my LD] ever really changed. I will always think of myself as a child with a learning disability. That doesn't change. It's an acknowledgement and an awareness that I've had a reading

problem and that a part of my emotional makeup is part of that.

Otherwise, participants typically reported having been labeled inaccurately.

> [Interviewer: Do you think you have a learning disability?] Participant: No. I think I had a lot of emotional problems. I can't really say whether I have a learning disability or not. I do know that I have some trouble, but actually the other kids didn't do as well as I did when I got in class. I went faster than anyone there [at Frostig].
>
> No, I think emotional problems. I was just too emotional. I had really bad problems and they affected me a lot and I'd get all emotional and then couldn't learn.
>
> No, I think it was mainly social problems. Doing what you're told to do. Disturbing the class. Not following instructions. Not being able to concentrate, that kind of stuff.

Whether the participants who do not believe they have an LD were labeled incorrectly at one or another point in their lives, or are in "denial" about having a disability, is just as difficult to determine as answering the question "What is a learning disability?" and contains all the pitfalls of such a determination illuminated above. It obviously depends on one's point of view. Again, from the point of view of our informants, using their own folk categories, they believe themselves to have an LD to the degree to which they suffer academic difficulties.

### Stage Three: Understanding/Negotiating the Label

Following the labeling event came a period where the participants (and their parents) struggled with two issues: (a) to understand exactly what having an LD meant in terms of what the child could and could not do, and (b) to resolve confusion as to what kind of help would be needed, especially as it related to school environment and special education placement. Although never stated specifically by informants, it appeared that the goal of this period was to choose the least stigmatizing label (i.e., between "mentally retarded," "severely emotionally disturbed," "learning disabled," "hyperactive," etc.), while still getting the maximum amount of one-on-one or small-group tutoring from service providers.

> I didn't understand. I thought I was retarded. I thought that someone with a learning disability, because it wasn't explained to me, was second to somebody with Down's Syndrome. That I was doomed to riding the short bus all my life, so to speak. I did not understand and it was very, very difficult.
>
> I have a problem with arithmetic. There's a difference between arithmetic and math. Arithmetic is pure numbers, division. The only reason I have a problem with arithmetic is because I reverse things, just like I do in spelling. But in mathematics I have no problems.
>
> They need attention. That's basically it. The way to cure someone, I think, with a learning disability, is to give them an extreme amount of personal attention. The problem is that it costs a lot of money to do that. There basically isn't that much attention to go around.
>
> I've never had problems with reading or writing. I have good writing skills. That's not why I was at Frostig. I've had problems with math all my life. That is what held me back through college. I still have problems. I still count on my fingers. Even considering I manage a large payroll.
>
> I went there another year and I had a more progressive type of teacher who I got along with, but I was still a problem with me with regards to the mainstream elementary school environment that I was later put into the private domain to help assess individually instruct me one-on-one in regards to the things that were causing me problems in the learning environment.

### Stage Four: Compartmentalization[9]

Once the extent and nature of the disability is clear in the informant's mind, the adaptive response is to place the disability in perspective relative to the informant's other attributes, that is, to *minimize its importance*. This is especially important with regard to other academic skills the subject may have. But it is also important that the informants do the reality testing necessary to reject labels that are not applicable to them, such as "emotionally disturbed" or "hyperactive," if they are not. In brief, the task of this stage is to *minimize weaknesses and maximize strengths*, both inside and outside the classroom, and "contain" the disability to classroom situations. Informants describe beginning to *explore special talents*, as well as cooperating in the remediation experiences offered.

> Actually I don't like the term learning disability. I don't like the term dyslexia because it has come to be known as a catch-all. I prefer reading and writing,

problems in reading or writing, or as S___ calls it a deficit in reading and writing. That's what I have. When you say learning problem, that doesn't mean I have a problem learning. The problem isn't learning. The problem is reading and writing.

I'm articulate. I like school, I just don't like school work. I mean I love learning; I love reading and being in classes. I just hate writing and trying to organize myself and writing papers and stuff.

But also I was really involved in photography and art. So that was really [inaudible] after school. I was good at something. [Interviewer: You had some special skills.] Participant: And I had something that didn't make me feel so bad. I knew I could do that. We had a photography lab and everything.

No, I think I'm pretty good at seeing the big picture. When I read the newspaper I get a good idea what somebody is saying here and get a feel for what they're really trying to get at, especially when you listen to politicians and stuff like that. I'm pretty good at figuring out where they're going to go with those arguments later on.

Like on my job today, there's almost no way for people to know I'm dyslexic. It's not something I wear around on a shirt or anything. But if I have to, if I go back to school, it will become a much more stressful thing because then I'll start noticing it more. As I have to start turning in papers and stuff like that, that's when it would certainly increase. And if I have to write handwritten notes, that's when it becomes stressful. Otherwise, there's nothing really there for somebody to put a label on. It's not like I'm missing an arm or something like that where somebody can see something.

At the time I kept calling it like a hospital school, I equated it to a special school. And I think the real reason I didn't like _____ I was beating my, my head was getting beaten against a wall on this reading and writing thing. I was starting to rebel right then and there. I couldn't take it anymore. I needed to move on. I needed to learn. After a while reading and writing, you just don't go anywhere.

**Stage Five: Transformation**

Similar to the task Reiff et al. (1997) described as "reframing," some of our informants reached a final stage of acceptance of their LD in which they saw the disability as a positive force in their lives.

Why don't you use the positive thing of being a dyslexic? Here's somebody who is going to carve a different path. Here is somebody who is going to learn in a different way. Society needs that. Acknowledge that and use that. That's a plus.

On the other hand, it is a benefit in that I know I can take anything that anybody dishes out at this point.

Proud of? Maybe just the ability to keep going. I have learned to keep going no matter what people said. No matter if it was inspired by anger or revenge or whatever, still it's ability to keep plodding along. It gives you mental toughness.

Yes. I notice that I have more tolerance for people than, say for example, my husband. Although he has tons of tolerance for anything that I do, but I realize he'll have little tolerance for maybe someone that happens to be working at the place at the time or something he doesn't think is up to speed. But I tend to have more tolerance for people and situations and I'm understanding. I don't think everybody should just be able to do things and know how to do.

As I said, I have dyslexia. I have never not had dyslexia. So it has always and always will affect my life. I don't know what it's like not to have dyslexia. I don't know that I want to do life over again without it. It's part of me. It will hinder me as it has and it will push me into places where I would never have gone before, like it did in college. I felt like I got a real smattering of everything, there's a term for it, liberal education. I wouldn't have gotten that if I didn't have dyslexia. I took everything.

## DISCUSSION

The findings discussed above are in general agreement with the results of qualitative research by other investigators on adults with LD. As mentioned, Reiff et al. (1997) reported stages of "reframing" the disability to have occurred with all their highly successful participants (p. 107). Some individuals moved through the four stages of reframing (recognition, acceptance, understanding, and action) "almost in unison, while others systematically moved from one to the next" (p. 106). However, although our study made similar observations as to the variability of individual development patterns, not all our participants passed through all the stages described in the present article (awareness, labeling, understanding/negotiation, compartmentalization, and transformation).

We had made judgments previously about the life success of each of our participants using a multidimensional

model of success (Raskind et al., 1999) and found that passage through the stages of acceptance correlated highly with success. Most of our successful participants had at least achieved a degree of compartmentalization of the disability and could talk about their strengths as well as weaknesses, but only a few of the most successful showed evidence of reaching the level of transformation where the LD is perceived as a positive influence in their lives. When comparing the present study to the Reiff et al. research, it should be remembered that there were certain differences in the populations studied. First, the Reiff et al. participants were a select group made up of only "highly successful" and "moderately successful" adults, whereas our population included both successful and unsuccessful participants. Among the less successful participants we interviewed, there were subjects at each level of development described above. Second, some of our participants did not believe themselves to have learning disabilities, but to have another kind of difficulty (academic related or nonacademic), whereas Reiff et al.'s individuals had volunteered for a study on persons with LD and thus believed themselves to have LD. Finally, Reiff and colleagues were able to conclude that some informants moved quickly and others slowly through their stages, whereas our participants had little to say about time spent in stages, whether one could "recycle" through a stage, or whether one stage could co-occur with another (however, see the Appendix for one opinion).

The present findings are also in agreement on several points with Hellendoorn and Ruijssenaars (1998), who investigated Dutch adults with LD. First, they confirm the first stage we enumerate, "awareness of a difference," pointing out "Almost all participants, even those with an early diagnosis, knew that something was the matter with them long before they were diagnosed" (p. 68). Further, they confirm the salience of "acceptance of the disability" by informing readers it was one of the 30 most frequently mentioned topics in their open-ended interviews.

In many regards, our transcripts point out how the difficulties faced by persons with LD mirror those of persons with other types of disabilities, especially in terms of dealing with stigma directed at them by the larger society. For example, Higgins (1980) summarized the line of research on stigmatization in sociology as it applies to the deaf, mentioning four processes of stigmatization: discrediting, master status, spread, and scrutinization. He describes *discrediting* (following Goffman, 1963) as focusing on a particular characteristic that is scorned and ridiculed. With the deaf it is often signing, while persons with LD get discredited on the basis of oral reading, spelling, or other academic deficits. The discredited characteristic then becomes a *master status* (Hughes, 1945). That is, individual characteristics are ignored in favor of those possessing the "failing" and all persons with the same failing are treated similarly, regardless of their achievements or other distinguishing characteristics. *Spread* occurs when additional negative characteristics and limitations are attributed to the outsider (disabled) group based on their original "failing" (Wright, 1960). Finally, *scrutinization* of the outsider individual becomes more intense as the outsider attempts to develop more intimate relationships with members of the larger social group, such as dating or marriage. Examples of all the above processes are numerous in the corpus of interview transcripts and may even be found in the few examples that have been included in this article for other purposes.

However, the plight of persons with LD differs from that of other disabilities in important ways. First, in the case of other disabilities such as deafness, motor impairment, or even mental retardation, once the disability is acknowledged, expectations for future achievements, especially in the area of disability, are adjusted to fit the kind and degree of disability. A particular individual with a disability is compared to others *with that disability* to make judgments as to successful vs. unsuccessful outcomes. For example, a blind individual might be considered a success if able to live independently, let alone to educate himself or herself to qualify for skilled, full-time employment. Further, it is expected that a blind person will require assistance from various institutions for necessities such as transportation, specialized technology, reading of mail and other printed material, and mobility throughout the person's life.

A person with LD, however, would be considered unsuccessful under the same circumstance of achievement, and prolonged assistance in the area of disability usually is not considered or planned for, much less provided by service organizations. While the comparison group for most disabilities is composed of others with that disability, persons with LD are compared to their nondisabled age cohort. For instance, the comparison group used by the researchers themselves (reflective of the view expressed by our participants, parents, and fellow service professionals) to determine whether our LD participants were successful was clearly typical individuals of the participants' age. The research suggests that not only researchers, but the participants, their parents and teachers, and perhaps even society as a whole, do not modify their expectations of persons with LD in terms of achievement in adulthood. Perhaps because the field is relatively new, alternative adult settings such as protected workshops, assisted living environments, half-way houses, and various types of job support, and

so forth, have not been developed and are not examined as alternatives for those individuals with LD who are not able to be as "successful" economically and in terms of independent living as their nondisabled peers. As a result, each family of an "unsuccessful" adult with LD is left to fend for itself in terms of financial and social services support, often facing a lifetime of caring for a dependent child. When placements *do* occur, such as in jails, mental hospitals, or protected workshops serving individuals with developmental disabilities, they often seem woefully inappropriate, if not outright damaging, to individuals with LD.

The failure to adjust expectations is fed by the notion, in many cases, that persons with LD will "outgrow" it, be "remediated" (thus "normal" again), "catch up," and join the rest of the class. Although there are exceptions, research roundly disputes such beliefs (for example, Gerber et al., 1990; Gottesman, 1994; Kavale & Forness, 1998; Patton & Polloway, 1992; Spekman, et al., 1992; Spekman, Goldberg, & Herman, 1993; Vogel & Adelman, 1993). Further, even our "successful" informants report experiencing many difficulties and failures in adulthood, especially in the area of employment.

Despite their expressed feelings of "differentness," the participants' accounts confirm that they do not consider themselves a separate culture, subculture, community, or (social) association. This differs from such groups as The Deaf Community who, many have argued, comprises a separate culture (Hall, 1989; Padden & Humphries, 1988; Padden & Markowicz, 1975; Padden & Ramsey, 1993; Rutherford, 1988; Stokoe, 1980, 1995; Turner, 1994). For the most part, our informants carry the beliefs, mores, and social organization of the majority culture in the United States, including such symbols from the private (or domestic) sphere as the one discussed in this article, "acceptance" (of death, hardship, adversity).

## IMPLICATIONS

By taking a contextual, ethnographic approach, new insights have emerged from the above research that indicate the strong influence of the positioning of our participants within the larger society, including social class membership, the relevance to our informants of being included in the category of persons with "learning disabilities," and the placement of "learning disabilities" among all disabilities, and thus among all outsiders, in the shared belief system of the majority culture. Those of us who have worked in the LD field over the past 20 years while these youngsters became teens, and then adults, realize that the composition of LD classrooms, schools and pullout programs has changed, becoming more homogeneously composed of children with academic difficulties. It has been differentiated from other difficulties as much by the emergence of new categories or subdivisions of other "disabilities" (for example, severely emotionally disturbed, autism, conduct disorder, oppositional disorder, attention deficit disorder, ADHD vs. ADD) as by what has occurred within the field of LD itself.

The finding that some of our informants concluded that their difficulties were not academic, that the etiology of their differences in the classroom was due to other causes (e.g., behavior, emotional illness), and that they do not possess the critical "symptoms" that we now use to define "learning disabilities," reflects the fact that the definition was in a period of flux when their age cohort proceeded through educational institutions where they were most likely to be referred. This process of identifying members of the class "learning disabilities" has differed across time as well as across state and national geopolitical boundaries. The fact that some of our participants could, and did, "choose" to *not* be a member of the LD subgroup as adults, preferring another designation (emotionally disturbed, behavior problems, etc.), or no designation at all, regardless of the loss of potential social services, speaks volumes to the power of the label in itself.

In any discussion of "acceptance" of an LD, these historical facts must be taken into account. It would seem that in our attempts to assist persons with LD to reach a state of "acceptance," we must include a careful empirical validation of the actual difficulties each individual manifests, keeping in mind that the person may *not* exhibit criterion symptomology at a particular time and place, but that the difficulties do, in fact, exist. In service of the goal of accurate identification, it seems that the field of LD is in a position to assist persons experiencing difficulties in school by continuing its efforts to agree upon a uniform definition of LD (such as the NJCLD, 1994, definition) that can be accepted by various service professionals as well as researchers, policy makers, general educators, and other players in the LD game. Further, it is clear from the lack of specific information participants and their parents have concerning their difficulties that they are receiving inadequate and/or conflicting explanations from professionals regarding LD. Consequently, a unified definition of LD must also filter into the understanding of service providers, and renewed efforts to inform professionals in all fields likely to come in contact with persons with LD are indicated.

Our participants have shared painful experiences of being teased, hounded, bullied, and ridiculed. In almost every case, the stigmatization and abuse received by this group far exceeds the severity of their difficulties. However, as McDermott and Varenne (1995) stated,

> It is one kind of problem to have a behavioral range different from social expectations; it is another kind of problem to be in a culture in which that difference is used by others for degradation. The second problem is by far the worse. (p. 330)

Perhaps it is time to move beyond the special education community and appeal to general educators and regular classroom teachers to discourage such blatant injustice. It is the hope of the authors that administrators and teachers of "mainstream" students will develop a proactive curriculum of tolerance and impartiality toward individuals with disabilities, and failing that, at least begin to admonish systematically their worst tormentors.

The above discussion bears one obvious outgrowth of the research, that is, to further develop a plan for facilitating acceptance. The information contained in this article may easily be used to develop a "curriculum" to assist persons with LD.[10] The arrangement of the stages suggests its content, but the development of the finer points of "acceptance of the learning disability" should include such notions as *rejecting inappropriate labels* that do not apply to the individual, and *recognizing and combating the negative valuations by others*. Persons with LD, in particular, appear to be vulnerable to developing confused and often negative self-images, which in many cases are based on misinformation they have received from peers, teachers, and professionals. Often persons with LD are assumed to be at fault when social acceptance is not forthcoming. The research and our participants suggest that strategies for modifying the behavior of the individuals around them and facilitating changes in the existing social milieu might be addressed as well. Suggested activities for educators, school counselors, and parents include establishing counseling groups focused on coming to terms with an LD, implementing peer support groups, developing mentoring programs and the like, as well as strengthening disability awareness curricula and transition services to include consideration of the notion of acceptance of a disability and of persons with disabilities, as well as the labeling process and its consequences.

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## APPENDIX

**Excerpts of Transcripts of Two Participants' Reactions to the Manuscript**

**Participant #1:**

I think you've got all the right things in here. The quotes seem to fit in the right places where they're supposed to be. I agree with a lot of it. The only thing would be [there's] too much of the negative stuff. What about the positive? I think a person reading this ... I would want to inspire people more. They need to be told that later it gets easier. I have a pretty good life now ... I have my own business I run by myself so I'm self-supporting through my own contributions. I thought I would be in the jewelry business [with my father] all my life but look what I've been able to do. I've made my own business and I do this completely on my own ... Kids today need to see an example of CEOs [who have dyslexia], and people who run their own businesses and are leaders in the world. What you said about [dyslexics being leaders within their]

families, about taking care of your parents, that's what I do now. My mother has [inaudible]. But it's OK because I'm here to help her when she gets weak and has to sit down. And after my father died, I was the one who took over and took care of the financial [arrangements] ... The leadership thing, I think that young people really need to know this. Even though they have dyslexia, they can do anything, be anything [they]want to be. They need to hear that message ... It's tough, especially when you are a kid. But they should hear more about the positive of what happens later, people feeling good about themselves. Their natural instinct is to be the follower, but they don't have to be. Later, they can do it. It's all about self-esteem. Having belief in yourself that you can do it.

**Participant #2:**

Like I said from the beginning, I can see myself in many of the quotes ... the emotions expressed by the other people were very accurate. Cuttingly accurate, in some cases.

I think yes, those stages are accurate. But it seems to me that some of those stages happen again. Like you cycle through them. Like my new job. I have to adapt again because the responsibilities are different. Now as a manager I have to do these performance reviews and I have to put together implementation plans ... things that require me to go back a step, say to myself, "It's OK. You can do this. You just need to adapt and figure out how you write these kinds of things." Whether I write more at home because I don't like people peering over my shoulder and seeing ... all my spelling mistakes. The fact that I work with the world's greatest spellers doesn't help. For a bunch of computer geeks, they sure can spell [laughter]. So I wonder maybe as you go through life if you don't go through some of these stages again. Maybe not all of them because obviously I've come to the acceptance that this will always be a part of me. I will always have this difficulty, but some of it you kind of cycle through.

## FOOTNOTES

[1]Anthropologists typically study face-to-face communities in which participants interact with one another continually. Hence, the expectation that one will find "shared" cognitions and concepts is reasonable. In the present study, most participants had never met one another, much less interacted over any period of time. Therefore, the authors did not expect a high degree of "shared" ideation to emerge, given that the participants did not form a community. However, since all participants belonged to the same larger culture and all held a similar position in it, we did expect a commonality in the difficulties they encountered and possibly a commonality of strategies for resolving them.

[2]The term "informants" is standard in the anthropological literature and is used interchangeably with "participants" in the present article.

[3]The pool of 206 previous Frostig students may have differed from other private or public school LD populations along some of the measures. For example, socioeconomic status was significantly higher than the average indicated by census data for the period for Los Angeles County (Raskind et al., 1999).

[4]For a detailed description of the quantitative analysis and findings, see Raskind et al., 1999.

[5]Hellendoorn and Ruijssenaars (1999) also found that "acceptance" of the learning disability was one of 23 frequently mentioned topics in their open-ended interviews with 30 Dutch adults with learning disabilities.

[6]For example, for many years insurance companies charged higher premiums for deaf drivers, even though there was no evidence that being deaf had a detrimental effect on driving skill. Eventually, the deaf boycotted auto insurance companies by forming their own insurance pools.

[7]Several other authors have addressed stigmatization in special education (see Barga, 1993; Forness, 1976; Hanson, 1997; Jones, 1971; Osmon, 1982; Smith, 1979; Vaughn 1998; Witcher 1987).

[8]In fact, Bos and Richardson (1994) cite Bogdan and Kugelmass (1984), who concluded, "there are no disabled students in the sense of absolute measurement. Mental retardation, emotional disturbance, learning disability and even blindness and other specific disability categories are ways of thinking about others, attitudes we take towards them, ways of structuring relationships" (p. 196).

[9]Use of this term traces back as far as Sigmond Freud and has been widely described as a psychological process in many contexts in the clinical psychological literature (Pedrini & Pedrini, 1972). In sociology, one use of the term is in multiple-role management (usually with a gender focus) to indicate insulation of a private role (e.g., father) from a public one (e.g., college instructor). (See, for example, Bird, 1982; Bryant, 1980; Gmelch, 1992.) References pertaining to stigmatization, self-esteem and disability in education and other settings include Crim, 1998; Reiff et al., 1997; Spencer, 1984.

[10]The authors are currently developing such a curriculum as part of a larger project involving further description of the six "Successful Attributes" discussed in Raskind et al., 1999.

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# THE CHANGING ROLES AND RESPONSIBILITIES OF AN LD SPECIALIST

*Janette K. Klingner and Sharon Vaughn*

***Abstract.*** **This article chronicles a single teacher's journey from expert resource teacher for students with learning disabilities (LD) to novice inclusion teacher and then expert inclusion specialist over a seven-year period. Through case study methodology, our purpose was to clarify the emerging role of the inclusion teacher by (a) describing her activities, (b) relating her perceptions of her role, and (c) explaining how her role differed in resource and inclusion settings over the years. Four broad categories emerged during our data analysis: assessment practices, teaching, consultation, and interpersonal skills. We concluded that the role of the inclusion teacher is complex and multifaceted and depends largely on the teacher's interpersonal and communication skills. The inclusion teacher must be knowledgeable about the general education (GE) curriculum, skillful at anticipating student difficulties with learning tasks, and adept at providing ongoing adaptations and accommodations. As increasing numbers of students with disabilities are educated in GE classrooms, preservice and inservice teacher education programs must address how best to prepare both GE and special education teachers for their roles.**

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Joyce teaches students with learning disabilities (LD). When she began her teaching career over 20 years ago, and for several years, she only taught students with LD in pull-out or resource settings. In the spring of 1993 her assistant principal asked if she would be interested in helping to start an inclusion program at her school. Joyce readily agreed. This article describes the changes in her role and responsibilities as she gained expertise as a co-teacher and inclusion specialist.

Inclusion programs that involve collaborative planning and teaching between general and special education teachers are increasingly used as the service delivery model for students with LD in schools across the nation (Council for Exceptional Children, 1994; McLeskey, Henry, & Axelrod, 1999). Yet the extent to which students with LD benefit from full-time placement in general education (GE) classrooms continues to be questioned (Fuchs & Fuchs, 1994; McLesky et al., 1999; Klingner, Vaughn, Hughes, Schumm, & Elbaum, 1998). Although a few advocates of the full inclusion movement would like to abolish special education and eliminate the need for "special educators" (Lipsky & Gartner, 1989, 1991; Stainback & Stainback, 1992; Thousand & Villa, 1990), the predominant approach to inclusion appears to be less radical — one that augments rather than replaces the continuum of services for students with special needs (Council for Exceptional Children, 1993; National Association of State Boards of Education, 1992).

Most seem to agree that nearly all students with LD should spend the majority of each school day in a general education (GE) classroom, and that most of their needs can and should be met in an inclusive environment (Klingner et al., 1998; Marston, 1997; McLesky & Waldron, 1995; Vaughn & Schumm, 1995). Inclusion in this latter sense calls for general and special educators to form partnerships that involve working together and learning from each other. These partnerships require a new role for special educators who previously were able to provide instruction for students with LD using materials and instructional approaches they alone felt were appropriate and in a setting outside of the GE classroom. As articulated by Ferguson and Ralph (1996), "this shift in role represents movement toward merging the parallel systems of general and special education into a single unified system …" (p. 49). Furthermore, for some resource teachers, "this shift in role threatens a loss of tradition, status, influence, and the very core of what makes special education *special"* (p. 49).

For the purposes of this article, we define inclusion as the placement of students with disabilities in the GE classroom full time with special education support services provided within the GE classroom setting (Idol, 1997). As general and special education teachers establish procedures for co-planning and instructing students with LD in inclusion classrooms, few precedents are available to guide them as they enter their new partnerships. We know a great deal about the role of the resource teacher (Gickling, Murphy, & Malloy, 1979; McNamara, 1989; Speece & Mandell, 1980; Wiederholt, Hammill, & Brown, 1978), but the role of the LD inclusion teacher has been less clearly defined and continues to emerge (Ferguson & Ralph, 1996; Idol, 1997; Pugach & Johnson, 1995). Those who have investigated general and special education teachers' views of and experiences with team teaching and collaborative consultation models have written about the challenges of such arrangements (Idol & West, 1988; Johnson, Pugach, & Hammitte, 1988; Myles & Simpson, 1989; Pugach & Johnson, 1995; Voltz, Elliott, & Cobb, 1994; Walther-Thomas, 1997; Wood, 1998). These challenges include (a) finding mutual planning time, (b) scheduling students and teachers, (c) large caseloads, (d) changes in administrative support, (e) personality conflicts, (d) inadequate consultation skills, and (e) less than clearly defined roles.

It is our position that by clarifying the role of the inclusion teacher, preservice and inservice teacher education efforts might be better directed. As noted by Kauffman (1994), the training special education teachers receive must distinguish their role from that of general education teachers (GE teachers). The skills needed to provide individualized, intensive, remedial instruction to a few individuals are different from those required to teach a whole class of students (Baker & Zigmond, 1995). Furthermore, teacher education programs continue to prepare prospective special education teachers for resource teacher but not necessarily inclusion teacher roles (Bos & Vaughn, 1994). A description of the role of inclusion teachers should assist in identifying the skills teachers need to perform effectively.

The purpose of this article is to clarify the emerging role of the LD inclusion teacher by focusing on the changes experienced by one LD specialist over a seven-year period. A few researchers such as Idol and Pugach have interviewed inclusion teachers and/or offered their expert opinions; however, no case studies could be located in the literature that chronicle a single teacher's journey from expert resource teacher to novice inclusion teacher and then expert inclusion specialist.

## METHODS

### Setting and Participants

For the past seven years we have worked cooperatively with an urban elementary school, Blue Heron, during its initiation of an inclusion program in 1993/1994 and as the inclusion model has expanded and changed over the years. This study complements other research we have conducted with the teachers and students in this school. (For a description of the academic outcomes of the students in inclusion classrooms, see Klingner, Vaughn, Hughes, Schumm, & Elbaum [1998]. See Vaughn, Elbaum, & Schumm [1996] for a report of students' social skills, Klingner, Vaughn, Schumm, Cohen, & Forgan [1998] for a summary of students' perceptions of inclusion, and Vaughn et al. [1998] for a description of the professional development provided to teachers.)

**Overview of the school.** Blue Heron is a K-6 school located in a large, diverse southeastern school district. Over the years the school's demographics have remained fairly consistent, with approximately 1,000 students a year (94% Hispanic), of whom about 77% were on free or reduced-cost lunch. In 1993, when there were 40 students with LD, the school employed two full-time special education teachers. In 1994, another full-time special education teacher was added when the number of students with LD increased to 64. The school continues to employ three full-time special education teachers.

**Overview of the resource model prior to 1993/1994.** Joyce and one other LD teacher shared responsibility for providing pull-out services to the school's students with LD and other high-incidence disabilities. Students with low-incidence disabilities had been transferred to other schools in the district. Joyce worked with K to 4th-grade students, while the other LD teacher provided services to

4th- to 6th-grade students. The resource program was housed in a portable classroom located at some distance from the school's GE classrooms, in a field adjacent to the school. Half of the portable was allocated to Joyce, the other half to the second teacher, with a partition in the middle. Joyce worked with groups of students that ranged in size from two to eight, for one half to two hours a day. Her total caseload ranged from about 23 to 28 students. Through a "homework club" she provided additional assistance before school hours.

**Overview of the inclusion program during its first year.** Joyce provided in-class instruction for 19 students with LD during inclusion's first year. She worked all day in three GE teachers' classrooms (second, third, and fourth grades), for 30-90 minutes in each class. All teachers volunteered to participate in the inclusion program. The number of students with disabilities placed in each of the three GE teachers' classes ranged from two to nine. The second special education teacher continued to provide pull-out special education services in a resource room, for approximately 22 5th- and 6th-grade students.

**Overview of the inclusion program during subsequent years.** During the second year of inclusion, the school qualified for a third special education teacher and was able to expand its model. Inclusion classrooms were added at the kindergarten, first-, and sixth-grade levels. Joyce continued over the next four years to work in three or four classrooms on any given day. In the fall of 1998, the special education teacher who had been providing pull-out services in the resource room transferred to another school (unhappy with the inclusion model and how it had impacted her resource program — she felt that she had been left with all of the "hardest to teach" students). The special education teacher who replaced her was a new teacher, anxious to teach in inclusion classrooms rather than the resource room. At this point, Joyce began teaching in the resource room each afternoon and in inclusion classrooms every morning. She continued in this fashion throughout the 1998/1999 school year and until she retired in the fall of 1999.

**Background information about the teacher.** Joyce taught as a resource teacher for 15 years and then as an inclusion specialist for six years. She holds a master's degree in special education. Prior to the first year of this study, she had never taught in a GE classroom. As a resource teacher, she had gained a great deal of experience assessing and teaching a range of students with special needs, including students identified as having cognitive disabilities, behavior disorders, emotional handicaps, and vision and hearing impairments; however, the majority had LD. Joyce was very well respected and liked by her colleagues and administrators as being an effective, competent teacher.

**Researchers' role in the school.** Over the seven-year period from 1993 to 1999, the first author spent a day at Blue Heron every week (for over 200 visits) (with the exception of a six-month period in which the second author regularly visited the school to provide assistance and collect data). The first author began working at the school as a researcher, but in 1994 when Blue Heron became a Professional Development School, she became the school's Professor in Residence. She regularly observed in inclusion classrooms and provided demonstration lessons. She kept a log of these visits. She also spoke with Joyce on a regular basis over the years, conducting tape-recorded interviews with her as well as numerous informal conversations. In addition, she met regularly with the GE teachers with whom Joyce co-taught. During the first three months of the 1993/1994 school year, when the inclusion model was first getting started, she met weekly with the entire inclusion team (general education and inclusion teachers) for approximately 30 minutes to discuss implementation practices. Over the years, she also met regularly with Blue Heron's administrators.

## Sources of Information

We gathered data from several sources for this research: (a) individual interviews, (b) focus group interviews, (c) classroom observations, (d) notes from meetings with general and special education teachers and administrators, (e) Joyce's journal and other written records and plans, and (f) a "think-aloud" procedure with Joyce. It is our position that the role of the inclusion teacher can best be understood within the school context and the sociocultural setting in which the role is performed. Roles are fluid rather than static, continually evolving based on the actions and perceptions of those involved (Biddle & Thomas, 1966; McLoughlin & Kass, 1978). Therefore, the same data sources were not used every year but were adjusted to provide additional information as needed to complete the portrait of Joyce's role as a resource room teacher (see Table 1).

**Individual interviews.** During the first year of this study we conducted three interviews with each participant using the format recommended by Seidman (1991) and Weade (1993). The purpose of the first interview was to develop a context for understanding participants' views regarding inclusion and to set the stage for further questioning. We asked teachers and administrators to tell about their *past* experiences related to students with special needs, the resource model, inclusion, and collaborative consultation. During the second interview, we asked teachers and administrators to talk about their *current* experiences related to students with special needs, inclusion, and

**Table 1**

***Overview of Data Sources by Year***

| | Interviews with Joyce | Interviews with administrators | Interviews with GE teachers | Focus group interviews | Observations in inclusion classrooms | Meetings about inclusion | Joyce's journal | Field notes |
|---|---|---|---|---|---|---|---|---|
| Year 1 (93/94) | X | X | X | | X | X | X | X |
| Year 2 (94/95) | X | X | X | X | X | | | X |
| Year 3 (95/96) | X | X | X | | X | | | X |
| Year 4 (96/97) | X | X | X | | X | | | X |
| Year 5 (97/98) | X | X | X | | X | | | X |
| Year 6 (98/99) | X | X | X | X | X | | | X |

collaborative consultation. It was in the third interview that we asked participating teachers to reflect on the meaning of their experiences. These interviews were conducted like conversations: Questions were followed by probes that varied with each participant. During subsequent years, some of our interviews continued with this conversational format, whereas others were semi-structured. The semi-structured interviews followed a prescribed list of questions and followup probes. Joyce was interviewed two to four times a year over the period of the study. In every case, interviews were tape-recorded and transcribed.

**Focus group interviews.** During the last year of the study we conducted two focus group interviews with Joyce, her co-teachers, and other GE and special education teachers (eight per interview) to ascertain their perceptions about the changing inclusion model at their school. Unlike individual interviews, the group setting of the focus group interview enabled participants to exchange ideas and elaborate on them through discussion (Stewart & Shamdasani, 1990). Focus group interviews followed the format suggested by Vaughn, Schumm, and Sinagub (1996), in that the moderator directed the group discussion using core questions that served more as a mental checklist than a strict protocol. Each focus group interview lasted approximately 90 minutes.

**Classroom observations.** During the first year of this study, a researcher observed in each of the inclusion classrooms an average of twice per month, and no less than once per month (18 observations minimum). Observations lasted from 30 to 50 minutes each. At first the observer primarily watched what happened in the classroom and took field notes. However, as the school year progressed, the observer interacted more frequently with the students and teachers in the classroom, assisting individuals and small groups, participating in lessons, and occasionally providing instruction. During the second year of the study, a researcher observed in each of the inclusion classrooms once a week, on average (Vaughn, Hughes, Schumm, & Klingner, 1998). During the third and subsequent years, the first author conducted observations in inclusion classrooms on a weekly basis (over 300 observations). These observations were conducted for a variety of research and professional development purposes (not only for this study). In some cases, the researcher kept field notes, in other cases she did not.

**Teacher meetings.** During the first year of inclusion, one of the researchers met regularly with Joyce and her

co-teachers to identify issues related to implementation of the inclusion model. These meetings took place two or three times a month for 30 minutes during the first four months of the school year, and then gradually less frequently (for a total of 18 meetings). The meetings were tape-recorded and transcribed.

**Joyce's journal and other records and plans.** During the first year of the study, Joyce kept a regular diary in which she recorded her impressions as a first-year inclusion teacher. She wrote about the challenges and successes she was experiencing on a day-to-day basis. She also used the journal as a way to ask questions about program implementation. The journal was interactive in that the first author regularly read the entries and provided feedback. The researcher photocopied the journal as a data source, while Joyce kept the original. Other records and lesson plans were similarly photocopied and added to our database.

**Think-aloud procedure.** We compiled our first year data and wrote up a description of Joyce's experiences during the first year of the inclusion model (1993/1994). During the last year of the study, we asked Joyce to read the report and stop periodically (no less than after every paragraph) to reflect about what she was reading and how the inclusion model had changed over the years. We tape-recorded and transcribed this think-aloud procedure.

### Data Analysis

As suggested by Miles and Huberman (1994), we conducted multiple flows of data analysis. As soon as data were collected (i.e., taped individual and focus group interviews, meetings, and Joyce's think-aloud), they were transcribed. We analyzed the transcriptions as well as our observation notes and Joyce's journal. After the first year of data collection, we generated and defined categories for analysis by independently examining randomly selected data sets and searching for common ideas and themes (Strauss & Corbin, 1990). We then met to negotiate a mutual set of broad categories. The categories that emerged through this process were as follows: (a) assessment, (b) teaching, (c) consultation, and (d) interpersonal skills.

Next, throughout the remainder of the project, we coded incoming data using coder-determined "chunks" of discourse or text (Evertson & Green, 1986). A "chunk" is defined as a sentence, paragraph, or larger segment of discourse or text that provides evidence of a particular category or theme. After coding subsamples of data sets using the defined categories, we conferred to compare responses, further revise, and resolve differences in coding. Intercoder agreement was defined as the number of "hits" (i.e., both researchers coded the data chunk in the same category) divided by the total number of responses. In no case was initial intercoder agreement less than .80. We resolved all differences of opinion until we had established 100% agreement. We also highlighted illustrative codes to be included in our report.

The final flow in our data analysis involved drawing conclusions and subsequently verifying them. Conclusions were drawn over time and reported if they were found to be "explicit and grounded" (Glaser & Strauss, 1967). We verified our conclusions by asking Joyce and other participants in the study for their feedback. In all cases they concurred with our findings. We met regularly throughout the project to discuss data analysis procedures and to determine whether additional data were needed.

## FINDINGS

We present our results in the four broad categories that emerged during our data analysis: assessment practices, teaching, consultation, and interpersonal skills. Within each of these categories we describe Joyce's responsibilities as a resource teacher, as a first-year inclusion teacher, and as an experienced inclusion teacher during subsequent years.

### Assessment Practices

Regardless of the service delivery model, Joyce conducted annual reviews of her students' progress using a standardized measure. She also assessed students' day-to-day learning on an informal basis. As an inclusion specialist her evaluations were much more tied to the general education curriculum than they had been previously.

**Resource model.** When she was a resource teacher, Joyce conducted two types of assessment. Once a year she evaluated her students using the *Woodcock Johnson Tests of Achievement* (WJ; Woodcock & Johnson, 1989) to determine how much progress they were making. She recorded the results on students' Individualized Education Plans (IEPs), rewritten once a year as part of an annual review. The second form of assessment involved informal measures of students' progress in the resource room. This type of assessment was not overtly connected to what students were doing in their GE classrooms or to the GE curriculum. Instead, evaluation procedures were determined by what Joyce judged students needed to learn to progress towards meeting the goals on their IEPs. She engaged in task analysis, figuring out what students already knew and needed to learn to master the next skill towards learning to read, write, or do mathematics. Joyce explained that she had "taught that little class (her special education students) as a whole, but it wasn't really what the (general education) teacher was doing."

**First-year inclusion.** As when she was a resource teacher, Joyce continued to administer the *Woodcock*

*Johnson Tests of Achievement* to her students annually to measure overall progress and to assist in writing updated IEPs. As an inclusion teacher, however, she felt she was more in tune with the classroom assessment procedures used by the GE teacher than she had been previously (e.g., spelling tests, math tests, or a school-wide, competency-based assessment of basic skills) and was better able to develop criterion-referenced, curriculum-based, and authentic assessments that matched the GE curriculum. Also, it became easier to administer behavioral assessment techniques (e.g., behavior rating scales or observations) because she was a regular member of the classroom and could observe students in a nonobtrusive manner. Joyce provided ongoing monitoring of instruction in the GE classrooms and evaluated her students' performances to determine the extent to which curricular modifications or extra assistance were needed. Given that her students usually completed the same assignments as their non-LD classmates, this became much more important in the inclusion model than in the resource model where assignments had been unrelated to the general education curriculum. She provided accommodations for students with LD, such as simplifying the language on tests, shortening the number of problems on a test, providing students with extra time to complete a test, or allowing students to dictate their responses to her rather than write them. Occasionally Joyce developed alternative tests for her students, as with spelling tests that consisted of easier words. Thus, Joyce's evaluations of student progress (other than the WJ) were much more closely aligned with the curriculum covered in the GE classroom than in previous years when she was in the role of a resource room teacher.

Joyce reported that much more *collaborative evaluation* took place when she was an inclusion teacher than previously. During the first year of inclusion, she shared a planning period with her co-teachers (set up deliberately by the assistant principal). This greatly facilitated the collaborative evaluation process. Because instruction took place in the general education setting, it was important that students' assessment, instruction, and curriculum needs be familiar to both teachers. As explained by the GE teachers: "Together we come up with ways of evaluating whether students are learning what we want."

**Subsequent years of inclusion.** After the first year, Joyce no longer shared a planning period with her co-teachers because the administration was not able to arrange teachers' schedules to coincide. Instead, for the next three years, she and the other inclusion teacher were paid extra to come in before or after school to meet. Scheduling became a challenge, however, as teachers tried to juggle their various responsibilities and meet on a consistent basis. By the fifth year of inclusion, money no longer was available to pay teachers extra for this purpose (because the principal allocated it differently). As a result, co-teachers infrequently met outside of class and the collaborative evaluation process became much more informal. Joyce explained, "We would talk kind of like every once in a while and say, 'Geez, this one is not doing very well,' and we would just do something, but we didn't go through and write notes on everything because they didn't give us a planning period anymore." Joyce lamented that they really were not implementing a cooperative consultation model any longer, "the way it used to be."

Years later when she reflected about the changes in inclusion over the years, she emphasized that collaborative evaluations were easiest during the first year when she was a novice because she had shared a planning time with her co-teachers. The administration had made co-planning a priority, and "it made it wonderful." Without time set aside to meet, co-planning and collaborative evaluations became much more of a challenge.

The IEP process also changed during the last year of this study. Joyce explained, "Now every single quarter, every time there is a grading period, you have to go back for the ESOL level [English proficiency level] and you have to look at the new IEP and you have to look to see if they have mastered any of those skills (written as objectives on the IEP). If they have, then you have to put MASTERED. If not, you have to put STILL TEACHING. The IEP has completely changed from when I was a resource teacher (when she did not have to reevaluate students every quarter). That is why there is so much on my plate. We have to take really a whole day away from kids or more to be able to do that every grading period." Joyce resented the time this increased paperwork took away from teaching.

Another change over the years had to do with a growing emphasis on high-stakes testing. Blue Heron, like other schools in the state, was facing increased pressure to do well on standardized tests. Joyce lamented, "I know that some of our children are unable to take the state tests due to frustration, and to think that those tests are to be counted against the school's ability to obtain funding in the near future is beyond my comprehension."

### Teaching

Teaching changed a great deal from the resource room to the inclusion model as well. It now involved co-teaching with the GE teacher, developing and implementing instructional adaptations, providing supplemental instruction, and assisting with homework.

**Resource model.** Joyce liked the sense of autonomy and independence she had felt when she taught in her

own resource classroom. Yet, she wished that she had had more time to communicate with students' GE teachers. She explained that she "pulled children from many different rooms … so, there was really not a time to speak with them." Most of the instruction she provided was not connected with what was being taught in students' GE classrooms. She felt that it would have been preferable to communicate more frequently.

**First-year inclusion.** *Co-teaching* was the way Joyce's role changed the most. During that first year she noted, "My role mainly has changed because now I'm sometimes team teaching, and I'm able to help a greater number of students, and I'm able to help my students fit into a regular [classroom]." Joyce reflected further, "With the resource model, there were a lot of students that just kind of fell through the cracks. With inclusion, you are able to help more than just your students. They just figure that I am another teacher in the classroom. They don't see me as being 'special ed.' They see me as being another teacher in the classroom and usually one that will help students that have problems and they want the help … I liked that."

It was adjusting to co-teaching that provided the greatest challenges to Joyce as a new inclusion teacher. At first she was apprehensive about what it would be like to teach with another teacher. In August of 1993, she was quite concerned about what her new role should be, and how involved and active she should be in the classroom, "I understand we are supposed to kind of like be team teachers in a way. But I'd like to know, what really am I supposed to do?"

One reason for her confusion was that Joyce felt she received mixed messages from district- and school-level administrators regarding co-teaching. She explained, "We were told, 'Joyce should not take the lead teaching a lesson, because that's not what she's paid for.' But I've been told before to collaborate, team teach, not be an aide." This anxiety reflected a concern expressed by all the teachers participating in the inclusion model that first year, "Our main thing is to do it *right*."

Joyce soon found that the ways she co-taught varied from classroom to classroom, and depended on the personalities of her GE partners as well as the needs of the students. Joyce said, "It is a hard role, because the special education teacher continually has to adjust and change their style depending on the teacher that they are working with. I work in all three classrooms very differently." Years later when she reflected about her first year as an inclusion teacher, Joyce felt that this was the greatest challenge she had faced. In part it was because the GE teachers differed in the extent to which they were willing to share control of their classrooms. One teacher wanted Joyce to take the lead when she was in his class. With another teacher Joyce shared control, teaching together or alternating as lead teacher. The third teacher, on the other hand, preferred to maintain the lead role. Joyce explained, "Most of the time she wants to do the complete class." Thus, an important characteristic of an inclusion teacher is the ability to either take the lead or follow as dictated by the situation. In fact, when later asked to what she attributed the success of the inclusion program, she concluded that the "main thing is being able to work with the homeroom teacher."

Another difference was an emotional one that involved "giving up" her kids and her classroom. Even though Joyce felt very responsible for the students with LD in the inclusion classroom, it was not the same as when they came to "her room" and she felt a sense of autonomy with "her students." She said she often missed the special feelings associated with instructing students in the resource room setting. But she quickly followed this by saying that there were also special feelings in the inclusion classroom. Related to this was a lack of personal space. Because she was in "other teachers' classes," she rarely had adequate space for instruction, materials, and her own personal items.

Providing *instructional adaptations* was one of Joyce's key responsibilities. Instructional adaptations were primarily of three types: (a) planned adaptations to assignments completed by the entire class, (b) spontaneous adaptations to assignments completed by the entire class, and (c) alternative assignments for the students with LD. Joyce tried to anticipate the kinds of difficulty students with LD would have with assignments and make adjustments. Many modifications were designed specifically to assist the students with LD but also seemed to benefit the entire class. Joyce sometimes adapted materials ahead of time. While planning with teachers or reviewing their lesson plans, she would note which activities might be difficult for some of the students with LD and then modify assignments while maintaining the overall objectives of the lesson. For example, she explained, "I take home the reading books and I read the story because that way it's fresh in my mind in case I get to class late. If I think the questions [for the story] aren't quite right, I redo the questions." Joyce added that these accommodations seemed to be helpful for all the students in the classroom. She also made some adaptations on the spur of the moment as dictated by students' needs. This type of assistance was typically provided to individual students when they got "stuck" while completing an assignment. Joyce explained that although for the most part the students with LD "fit into what everybody else was doing, sometimes they are going to have to dictate to me, and I will write it down and they will have to copy it. Or they might need a little bit more help, like me questioning them, and like somehow pulling the answers out of

them." The classroom teacher, an instructional aide, and even other students also provided this type of assistance.

At times Joyce and the GE teachers decided that some of the students with LD would be better off completing an alternative assignment. For example, Joyce typically taught different (easier) spelling words to most of her 2nd- and 3rd-grade students with LD. She would then administer a spelling test to the students with LD at a side table while other students worked individually at their seats on a different assignment. After the spelling test, she often provided direct instruction in phonics to this group. This alternative spelling and phonics instruction was very similar to what Joyce had taught students during previous years in her resource room. She believed that it was important for many of her students to receive this explicit instruction in phonics, particularly because word attack skills were not taught directly as part of the whole-language reading program the school implemented up until the 1998-99 school year.

Despite efforts to provide appropriate instruction within the GE classrooms, Joyce and the GE teachers expressed concerns that the lowest students with LD were not receiving enough instruction at their level. Occasionally, Joyce and a classroom teacher decided that it would be in students' best interest to receive supplemental individualized instruction. For example, Joyce worked with a group of six third-grade students with LD when the rest of their class studied Spanish with a different teacher so that they could get extra instruction in phonics and word attack skills. Joyce was quick to point out that this arrangement differed from the resource model of previous years because students were not missing any instruction from their GE teacher as a result.

Joyce provided homework assistance for students with LD in two important ways. First, she often adapted the homework provided by the GE teacher, either by developing an alternative assignment, shortening the amount of work required, or talking to the GE teacher about applying different standards of evaluation when correcting homework. Second, she started a "Homework Club" that met from 7:45 to 8:15 every morning. As she explained, "The students [with disabilities] come in to see me first thing in the morning to show me their homework. I check it with them and make sure it is right."

**Subsequent years of inclusion.** After the first year, co-teaching became easier as Joyce felt increasingly comfortable and confident in a co-teaching role. She was not as concerned with "doing it right" as judged by others' standards. As the years passed, Joyce and her co-teachers developed different ways of maximizing the benefits of having two teachers in the classroom. For example, they restructured their two-hour language arts block so that the class was divided into fourths (which they referred to as "centers"). Each teacher worked with one group of students for a half-hour on a specific activity, such as the writing process or Making Words (Cunningham & Cunningham, 1992; Cunningham & Hall, 1994), and then the groups rotated. Joyce reflected, "In the last couple of years, we had a lot more of this going on than in the beginning of inclusion where it was almost all whole-class instruction, and I might have co-taught a lesson and afterwards spent time with my children. In the last two years, we have had a lot of our centers and I feel that it has been great. We've had less cooperative consultation, but we've had more of the small-group instruction." It might also be said that over the years Joyce looked for ways to simplify her role. Her first year as an inclusion teacher was characterized by countless extra hours of work. During subsequent years she didn't put in quite as much additional time preparing modified materials for her students or working with them before and after school.

Joyce noticed changes over the years in the ways in which her GE partners provided instruction to their students with LD. They became more positive, accepting, and encouraging. Joyce noted, "They got to where even with students that were not performing as well, they would always recognize the good things that they did, so that other students could see that they are good, too. That makes a big difference in the social aspect of our students. They might not know how to write it as well, but they have the ideas and they could participate, and our kids felt more at ease and the teachers recognized that."

Joyce described additional changes she has experienced over the years in inclusion, some of which have challenged the inclusion model and brought about frustration. First, she said, "The amount of time we must spend outside of the classroom has increased due to teacher trainings, IEPs, CSTs [Child Study Team meetings], ESOL testing, yearly testing, illness, etc., and this leaves our children without their ESE [Exceptional Student Education] teacher (more often than before)." When special education teachers are required to miss instructional time with their students, no substitute teachers are hired to take their place and provide coverage. Joyce believes this policy should change.

Second, Joyce contends that high-stakes achievement testing has affected the co-teaching model. Administrators and teachers have experienced increased pressures to do well on these tests "at all costs," which has caused conflict with students' IEP goals. She said, "The [GE] teacher lets us know what is expected because they are the ones that are mandated, especially this year with the FCAT [Florida Comprehensive Assessment Test]. We have to fit in our goals and everything from the IEP, but they are more or

less telling us 'this is what has to be done.'" Joyce felt discouraged because she perceived that her students' needs were not receiving enough priority. She elaborated, "Their needs are so much greater than the other children in the classroom … sometimes (before) when I saw that their needs weren't being met, I made time within that classroom period in those two hours to try to work with them alone. But this year it is much harder to do because of the emphasis on the FCAT."

### Consultation

By necessity, consultation was much more prominent in the inclusion model than in the typical resource model. The aspect of consultation that received the most emphasis by the participants in this study was planning.

**Resource model.** Joyce spent virtually no time co-planning as a resource teacher. She explained, "What I used to do when I only had a couple of students who were in different classes, I would go before school once a week and say 'what are you teaching this week?' like in math, and that was about it." Co-planning had not seemed necessary when she was a resource teacher. She was able to teach what she wanted and did not have to "worry" about what they were doing in the GE classroom. A GE teacher described the resource model in this way, "We did communicate a great deal, especially when it came to followup and if I had any problems, since she worked with the students more closely than me and she was more in touch with the parents. As far as planning together, just projecting where we wanted to go, we did not. She had her own agenda last year and I had my own because we were working in different areas."

**First-year inclusion.** During the first year, the administration allocated mutual planning time to Joyce and her co-teachers. These meetings took place at a set time once a week, in the middle of the day while special subject area teachers (e.g., Spanish, art, or music) taught their students. At the beginning of the year these meetings were scheduled for 60 minutes, but eventually they were cut to 30 minutes so Joyce could spend more time working with students. Teachers "discussed the planning for the following week and how we could best work together." Once a month they went over the goals and objectives from students' IEPs and discussed "if we were meeting them or if we needed to switch over to another one if they have accomplished that goal, and we discussed that in-depth." As part of these efforts, they also completed a collaborative consultation form for each student with LD, recording students' progress, setting goals, and planning interventions. In addition, Joyce sometimes developed her own plans when she saw that students needed extra help, and explained her planning this way: "When it comes to planning, I make my own individual plans, but they correspond with the plans of the teacher." Her plans were designed to meet the students' IEP objectives and to help them achieve success in the GE classroom.

As with the actual teaching, the nature of the collaborative consultation meetings varied depending on the personalities and styles of the individuals involved. At first one GE teacher took the lead when planning, while in another case Joyce took the lead. Planning meetings became more collaborative over time. All teachers involved were enthusiastic about the collaborative consultation process. One GE teacher noted, "I think it's a great thing. We really do have a feel for our children, all of our children, more than ever before." However, teachers sometimes complained that they felt "bogged down" with the large amount of paperwork required by the additional planning.

Joyce was very conscientious about making sure that the services students received matched their IEPs. She noted, "I make sure the IEPs correspond with the goals of the GE classroom and then I monitor the students based on their IEPs." In September that first year, she met with parents and rewrote IEPs so that they were in compliance. She met with district office personnel ahead of time to ensure that she did this correctly. GE teachers also frequently referred to students' IEPs when they discussed instruction and planning. This was a dramatic departure from the resource model years when the GE teachers had been much less aware of students' IEP goals. Yet, they sometimes felt discouraged when their students with LD were not making faster progress. One GE teacher explained, "It's frustrating when you look at their papers and think, 'They don't get it.' But then you have to think, even if they spell every single word in a sentence wrong, they capitalized the first letter, and they put a period at the end. And that was an [IEP] objective." Reflecting about this years later, Joyce noted, "That was the hardest thing for the teachers at first."

Part of Joyce's role was sharing her expertise with GE teachers regarding how best to work with students with LD. For example, she shared with classroom teachers "when to make a big deal" about a child's relative successes and to provide positive reinforcement. She also counseled teachers not always to have the same expectations for students with LD, and reminded them that students with LD often need more time to complete a task. Joyce sometimes found it difficult to make suggestions to classroom teachers, particularly regarding changes she thought should be made but that they might be resisting. For example, one teacher seemed to target instruction towards higher performing students. Joyce's goal was to get this teacher "to gear lessons

towards the middle, and provide enrichment activities for those who finish early." Also, this teacher's grading procedures were a continuing concern. Joyce advised her to "count the things right, not the things wrong" and "at the end of a test, don't tell the whole class what everybody's grade is — grades are private."

**Subsequent years of inclusion.** After the first year, because the administration no longer arranged teachers' schedules so they could meet during the school day to plan, teachers met before or after school. Joyce had no planning period. She said, "I was coming in at 7:30 a.m. and leaving at about 4 p.m. daily and still had two or three hours of work to do at home, at least four days of the week." Co-planning became easier when teachers began using centers more regularly, however. Joyce explained, "We didn't have to write things down unless we saw a child with a special need and I might have to do something for behavior, a behavior modification thing. We planned more for groups and I might be in charge of a certain group and the other teacher would do another center." She added, "Other than that, the only thing that has changed is that we don't have to do cooperative consultation every month, we more or less do it informally. We don't have to fill out all those papers because now we have so much more that has to go on the IEP [e.g., quarterly information about how students are progressing]. The IEP is terrible now … I really feel that they are going to lose a lot of special ed. teachers."

### Characteristics of Joyce: An Inclusion Teacher

**Interpersonal skills.** Joyce's co-teachers used many adjectives to describe her personality, such as *sensitive, considerate, nonjudgmental, supportive, adaptable,* and *flexible.* As one GE teacher explained, "She is the most flexible person. She goes from three classrooms with totally different teaching styles. And, she is always positive, she just adapts." Joyce concurred that it is important to be adaptable. She advised, "The main thing is that she [an inclusion teacher] has to be a very flexible teacher. And be able to take into consideration how the other teacher is going to feel. It's like a marriage, it has to be with two compatible people who can talk things out." Also, "You have to be willing to hear other people's suggestions."

**Sense of responsibility.** Joyce felt a strong sense of responsibility for the education of the students with LD, referring to them as "my students." As the GE teachers noted, "She is so conscientious and concerned." As evidence of this sense of responsibility, Joyce gave up her personal planning time to provide additional assistance to students. She felt responsible for the learning, mastery, and personal welfare of each of the students with LD in the classroom. If they were not keeping up or did not understand a lesson, she never blamed the students, but instead felt compelled to figure out a way to ensure that they made progress in their learning.

**Advocacy.** Joyce was also an advocate for her students. She believed that it was her responsibility to look out for each of her students in their GE classrooms as well as around the school. For example, when one teacher announced to the entire class that one girl with LD had received an "F" on her spelling test (even though she had spelled five words correctly, more than on any previous spelling test), Joyce became visibly upset. She waited until the students had left the room and then spoke privately with the teacher, convincing her that it was not fair for this girl to receive an "F" when she had spelled five words right, and dissuading her from divulging students' grades publicly in the future.

**Sense of autonomy.** Joyce felt that the school's administration allowed her a great deal of leeway in deciding how to implement the inclusion model. She was told, "Do it however you feel is going to be best." This sense of being trusted and respected by the administration seemed valuable in enabling her to take risks as she explored her new role as an inclusion teacher. She also felt that she had the "ear" of the administrators if she needed assistance. "I know I can always go to Kathy [the assistant principal] and she will listen and problem solve with me."

**Respect.** Joyce was respectful of the teachers with whom she worked. She discovered early on that GE teachers had curriculum and student demands that exceeded her understanding and that GE teachers were faced with different priorities than hers. She learned to respect the struggle GE teachers experienced while trying to cover content objectives and curriculum and yet "slow down" so students can learn.

**Philosophy of learning.** Joyce believed in and modeled the philosophy that all students can learn. She stressed the importance of treating all students in the class as important, contributing members of the community. After working with Joyce for several months, one GE teacher noted, "We have these kids trained so that they know they have the power to do the work. Other teachers say, 'I don't give them the books because they can't do anything,' but that isn't how we do it in my room." This teacher told about a third-grade girl with disabilities who had been in another classroom where "they wouldn't even give her books because her ability was so low." The third grader cried every morning and clung to her mother when she dropped her off at school. Three days after she was transferred to the inclusion classroom, "she was coming to school smiling and saying, 'I love you.'"

## DISCUSSION

The goal of the case study presented in this article was to describe the changing roles of an LD teacher and to clarify how her responsibilities differed as a resource room teacher, a first-year inclusion specialist, and an experienced inclusion specialist.

What did we learn? Joyce's role as an inclusion teacher for students with LD was complex and multifaceted and depended largely on her successful interpersonal and communication skills. Much of the knowledge and skills she required was a blend of (a) special education assessment and intervention skills, (b) the ability to creatively adapt and accommodate instructional lessons and assignments to meet the needs of students with LD in a whole-class setting, (c) an understanding of the general education curriculum and goals, (d) the ability to collaborate and co-plan with GE teachers, and (e) commitment and dedication.

How did being an inclusion teacher differ from being a resource room teacher? The most obvious difference was co-teaching. Joyce found this change in her role the most difficult as she struggled to adjust to the different personalities and styles of her co-teachers. We believe that the extent to which co-teaching is acceptable to teachers is highly relevant and influences their success and satisfaction with their roles in an inclusion model.

Along with co-teaching came the need to co-plan. In the inclusion model planning became more complicated. Whereas as a resource teacher Joyce had asked herself, "What is the best way to teach the objectives listed on the IEP and meet this student's individual needs?," as an inclusion teacher she asked herself and her co-teacher, "What is the best way to teach the objectives listed on the IEP and at the same time help the student fit in and be successful in the GE classroom?" Thus, the curriculum and goals of the GE classroom drove instructional decision making to a much greater extent. An inclusion teacher must be knowledgeable about the general education curriculum, skillful in anticipating student difficulties with learning tasks, and adept at providing ongoing adaptations and accommodations. As has been described elsewhere (e.g., Friend & Cook, 1992; Pugach & Johnson, 1995; West & Idol, 1990), co-teaching and co-planning necessitate (a) communicating frequently and effectively with another professional, (b) sharing power and control over assessment and instructional decisions, and (c) being flexible.

One of the greatest challenges Joyce faced as an LD inclusion teacher was maintaining a focus on the needs of the individual within the context of the GE classroom. Baker and Zigmond (1995) found that the LD inclusion teachers at their five school sites replaced concern for the individual with concern for the group once they were confronted with the demands of the GE class. It was our impression that Joyce was able to maintain a focus on the needs of her individual students with LD, but that doing so was difficult and labor intensive. For example, during her first years as an inclusion teacher, when she felt an individual student would not be able to complete an assignment designed for a group (even with adaptations), she developed an alternative activity that she felt would be more appropriate. But she was less likely to do this in later years.

How did the inclusion model at Blue Heron change over the years? In some ways it became easier, as teachers grew accustomed to working with one another and learned to co-teach more effectively. All teachers involved with inclusion spoke very favorably about the rewards of the model for teachers, and especially students. They valued what they learned from working collaboratively, and felt that students grew both socially and academically. Yet, in other ways, inclusion became more challenging over the years as administrative support at the school waned and external changes from national, state, and local levels added pressure and stress to the job. Barriers included (a) lost collaborative planning time, (b) increased paperwork due to requirements for more extensive and more frequently updated IEPs, (c) additional responsibilities outside of the classroom, (d) increased class size, (e) a growing emphasis on high-stakes testing, and (f) pressure to do well in the state's new school grading system. These obstacles were similar to those faced by others implementing inclusion (Fisher, Sax, & Grove, 2000; Walther-Thomas, 1997), and point to a need for ongoing commitment and support if successful inclusion models are to be maintained.

**Limitations.** The generalizability of this study is limited because we tracked the career changes of only one individual. However, although it is possible that Joyce's adjustments and reactions to her changing role were idiosyncratic, based on our understanding of the relevant literature we do not think this was the case. It should also be kept in mind that there was a strong researcher presence in the school throughout the seven years of this study. We know that our role in validating and supporting Blue Heron's emerging inclusion model influenced everyone involved at least to some extent (see Klingner, Arguelles, Vaughn, & Ahwee, 2001, for an in depth examination of the school's inclusion program).

**Implications.** It is our belief that the role of the LD inclusion teacher cannot adequately be performed by a GE teacher serving in a teaming role, or by a paraprofessional working as an assistant. The responsibilities of the LD inclusion teacher require a sophisticated set of knowledge and skills that can take years to learn and develop (Baker & Zigmond, 1995). In an optimal arrangement,

the LD inclusion teacher must be an expert in teaching students with LD, and at the same time be informed about the GE curriculum and various teaching approaches. Conversely, all GE teachers who work with students with LD should receive some preservice and inservice information about LD, but should also be experts in the general education curriculum and a variety of teaching approaches. In this way, general education and special education teachers can complement each other, with each possessing a different area of expertise and an awareness and appreciation of the other's strengths. The reciprocal nature of their interactions should be conducive to an effective collaborative relationship (Johnson et al., 1988).

How should inclusion teachers be prepared for their role? First, we observed that Joyce's training as an LD specialist served her well in her new role as an inclusion teacher. Her knowledge of special education, IEPs, assessment, instructional practices, and methods of making adaptations and accommodations was necessary in her role as a resource room teacher and an inclusion teacher. These skills were also highly valued by the GE teachers with whom she worked. Thus, the demands of the inclusion role might best be met by special education teachers who have experience in providing intensive, individualized instruction. Additionally, Joyce needed three other sets of skills that the literature suggests (Bos & Vaughn, 1994; Pugach & Johnson, 1995) are not adequately taught in teacher preparation programs: (a) consultation and communication with other professionals, particularly GE teachers; (b) knowledge of the general education curriculum and skills in adapting this curriculum; and (c) knowledge of instructional approaches appropriate for heterogeneous GE classrooms, and how to implement them in a co-teaching situation.

Successful inclusion is unlikely to occur unless general and special education professionals share possession of the skills necessary to adequately meet the needs of students with disabilities in the GE classroom. Although the results of this case study are not generalizable, they do provide food for thought. As increasing numbers of students with disabilities are educated in GE classrooms, preservice and inservice teacher education programs must address how best to prepare both GE and special education teachers for their roles (McLeskey et al., 1999).

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# TREATMENT VALIDITY AS A UNIFYING CONSTRUCT FOR IDENTIFYING LEARNING DISABILITIES

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***Abstract.*** **The purpose of this article is to revisit the issue of treatment validity as a framework for identifying learning disabilities. In 1995, an eligibility assessment process, rooted within a treatment validity model, was proposed that (a) examines the level of a student's performance as well as his/her responsiveness to instruction, (b) reserves judgment about the need for special education until the effects of individual student adaptations in the regular classroom have been explored, and (c) prior to placement, verifies that a special education program enhances learning. We review the components of this model and reconsider the advantages and disadvantages of verifying a special education program's effectiveness prior to placement.**

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Over the 25-year history of the Individuals with Disabilities Education Act, the percentage of students with learning disabilities has increased dramatically so that students with learning disabilities now comprise more than 50% of all children with disabilities (U.S. Department of Education, 1999). This precipitous increase in the prevalence of learning disabilities has raised questions about the methods by which these children are identified.

Concern over the process by which students with learning disabilities are identified appears well founded. Because learning disabilities are a "soft" disability (Reschly, 1996), for which no discernable physical markers currently are known, the identification process is subjective. Moreover, because learning disabilities are associated with unexpected failure to learn, the discrepancy between intelligence and achievement is the central organizing theme of most definitions of learning disabilities. Yet, the measurement of those discrepancies has proven problematic due to poor reliability of difference scores (Reynolds, 1984); in fact, varying discrepancy formulae and test instruments identify different sets of students (Shepard, Smith, & Vojir, 1983). In addition, research documents similar underlying deficits in children with reading disabilities who do and do not demonstrate discrepancies (Fletcher et al., 1998). These problems have led some to question the viability of the learning disabilities concept.

At the same time, public awareness about the scientific controversy over learning disabilities has grown. One reason for increasing public awareness is the high cost of a special education — more than double the cost of regular education (Parrish, 1995). Another reason is the phenomenon of overrepresentation of students of color in special education. This has prompted placement bias litigation (*Larry P. v. Riles*, 1979/1986;

*Marshall et al. v. Georgia*, 1984/1985; *S-1 v. Turlington*, 1986), which has led to public debate over learning disabilities and mild mental retardation identification issues (e.g., Polloway, 1985; Reschly, 1984, 1988; Snow, 1984) and about the very quality and value of special education services (D. Fuchs & Fuchs, 1995a, 1995b; Reschly, 1996).

The 1982 National Research Council's (NRC) (Heller, Holtzman, & Messick, 1982) analysis of the problem of minority student overrepresentation set the stage for much of the focus, tone, and substance of this debate. That NRC report reformulated the problem of overrepresentation from one of reducing disproportionality to that of determining the conditions under which inequality constitutes inequity of treatment. According to Messick (1984), disproportion signifies inequity only when children are unduly exposed to classification because they receive poor-quality regular education, are assessed invalidly for special education, or receive an ineffective special education that hinders their educational progress.

Over the past decade, this reformulation of the overrepresentation problem, along with the increasing prevalence of learning disabilities, concern about conceptual and technical issues with the identification of learning disabilities, and questions about special education costs and effectiveness, has fostered calls for eligibility decision making that relies on treatment validity as a unifying concept. With a treatment validity approach, the value of an eligibility assessment process is judged by its capacity to simultaneously inform, foster, and document the necessity for and effectiveness of special treatment (e.g., Reschly, 1988; Reschly & Grimes, 1995; Witt & Gresham, 1985). A treatment-oriented approach to identification strives to eliminate the inequity potentially associated with overrepresentation of minority students in special education by maximizing regular education's potential effectiveness for all students and reserving judgment about the need for special education until the effects of individual adaptations in the regular classroom have been assessed and until evidence verifies that a special education program enhances learning.

In 1995, L.S. Fuchs described how curriculum-based measurement (CBM; Deno, 1985), a well-developed assessment system that permits modeling of students' responsiveness to instruction, can be used within a treatment validity approach to the identification of learning disabilities (also see L.S. Fuchs & Fuchs, 1998). One important component of that model was that special education demonstrate its value before a student is eligible for those special education services. This component has created controversy (e.g., Martin & Fuchs, 2000).

In this article, we consider the advantages and disadvantages of this component. We begin by providing an overview of the model as it originally was proposed, and we consider evidence supporting the tenability of a treatment validity approach. We then review the rationale for requiring special education to demonstrate its added value and consider the potential disadvantages of this model component. We conclude by proposing a modified treatment validity model for identification of learning disabilities.

## THE TREATMENT VALIDITY MODEL AS ORIGINALLY PROPOSED

### Assumptions

Most assessment frameworks for identifying students with disabilities who require intervention beyond standard classroom instruction focus on the absolute level of a student's performance, relative to similar peers, at a fixed point in time. A treatment validity approach, by contrast, requires that special education be considered when a student not only performs below the level of peers but also demonstrates a substantially lower learning rate; that is, the student manifests an unresponsiveness to the instructional environment. We refer to unsatisfactory performance along with inadequate growth as a "dual discrepancy."

An example from pediatric medicine illustrates the rationale for a focus on dual discrepancies. The endocrinologist monitoring a child's physical growth is interested not only in height at one point in time but also in growth velocity over time (Rosenfeld, 1982). Given a child whose current height places him or her below the third percentile, the endocrinologist considers the possibility of underlying pathology and the need to intervene only if, in response to an adequately nurturing environment, the child's growth trajectory is flatter than that of appropriate comparison groups. Based on long-term, large-scale normative information (Tanner & Davies, 1985), this criterion, at age 7, for example, is operationalized as an annual growth rate of less than 4 cm. So, the physician judges a 7-year-old who is short relative to peers, but who is nonetheless growing at least 4 cm annually in response to a nurturing environment, to be deriving available benefits from that environment and to be an inappropriate candidate for special intervention.

The endocrinologist's decision-making framework reflects three assumptions. First, genetic variations underlie normal development, producing a range of heights across the population. Second, in response to a nurturing environment, a short but growing child does not present a pathological profile but rather suggests an individual who may legitimately represent the lower

end of the normal distribution on height — an individual whose development is commensurate with his or her capacity to grow. Third, under these circumstances, special intervention is unlikely to increase adult height sufficiently to warrant the risks associated with that intervention. Alternatively, when a child is not manifesting normatively appropriate rate growths in a nurturing environment, additional assessment is warranted to determine whether more obtrusive forms of treatment are needed. (When questions arise about the quality of the environment, the first-level response is to remove those uncertainties by enhancing nurturance so that growth can be tested under adequate environmental conditions.)

The endocrinologist's decision-making framework translates into three related propositions for the identification of learning disabilities. First, because student capacity varies, schooling outcomes will differ; so, a low-performing child who nonetheless is learning may ultimately perform less well than peers. Second, if a low-performing child is learning at a rate similar to that of other children in the same classroom, he or she is demonstrating the capacity to profit from that educational environment. Therefore, the student probably does not require a unique form of instruction and probably is achieving commensurate with his or her capacity to learn. Third, under these circumstances, the risks and costs associated with entering the remedial or special education system are deemed inappropriate because it is unlikely, in light of the growth already occurring, that a different long-term outcome could be achieved as a function of that intervention. By contrast, when a low-performing child fails to manifest growth in a situation where others are thriving, alternative instructional methods must be tested to address the apparent mismatch between the student's learning requirements and those represented in the conventional instructional program. (As with the endocrinologist's framework, when the educational environment is insufficiently nurturing, as revealed by inadequate learning for the majority of students in a class, classroom intervention must occur to enhance the overall quality of the instructional program. That is, growth under more nurturing conditions must be indexed before any child's need for special intervention can be assessed.)

### A Treatment Validity Model

Together, these assumptions led to a proposal for an alternative model of learning disability identification that relies on treatment validity as its unifying concept. With this model, Phase I assessment is used to determine whether the overall rate of responsiveness in the classroom indicates that the instructional environment is sufficiently nurturing to warrant individual student decisions. If the mean rate of growth in the classroom is low, when compared to other classrooms in the same building, in the same district, or in the nation, the appropriate decision is to intervene at the classroom level to provide a stronger instructional setting.

Once the presence of a generally nurturing regular classroom instructional environment has been established, Phase II assessment is used to identify children with dual discrepancies; that is, students whose level of performance and rate of improvement are dramatically below those of classroom peers. Phase III assessment generates the database for enhancing instruction in the general education classroom and determining whether that regular education setting can, with adaptations, produce better growth and thus be transformed into an acceptable learning situation for the individual. Only when corrective action fails to yield improved growth does consideration of special services to supplement the general education program become warranted.

If so, prior to a learning disability classification, Phase IV assessment evaluates special education effectiveness for a given student. If special education effectiveness for that child cannot be documented, no compelling rationale exists for assigning a learning disabilities label or removing the child from the classroom for instruction. This last phase is the component of the model that has generated controversy. Later in this article, we return to this topic.

### CBM's Contribution to a Treatment Validity Approach to Identification

Within a treatment validity approach to identification, an assessment system must document that (a) the regular classroom is producing acceptable growth for many students and thus is nurturing, (b) important dual discrepancies on performance level and growth rate exist between a target child and classroom peers, (c) inadequate individual learning occurs even with general education adaptations, and (d) improved growth can be derived with the provision of a special education. To provide these multiple sources of documentation, an assessment method must be valid for modeling academic growth, distinguishing between ineffective general education environments and unacceptable individual student learning, informing instructional planning, and evaluating relative treatment effectiveness. CBM is one assessment method that can generate these multiple sources of documentation.

The purpose of CBM is to index academic competence and progress. In developing CBM, Deno (see Deno, 1985) sought to establish a measurement system that (a) teachers could use efficiently; (b) would produce accurate, meaningful information with which to index standing and growth; (c) could answer questions

about the effectiveness of programs in producing academic growth; and (d) would provide information that helped teachers plan better instructional programs. A 15-year research program has addressed questions about features of the measurement system (what to measure, how to measure, and how to use the resulting database) against issues of technical adequacy, treatment validity, and feasibility in the domains of reading, spelling, mathematics, and written expression.

In each domain, CBM integrates key concepts from traditional measurement theory and from the conventions of classroom-based observational methodology to forge an innovative approach to assessment. As with traditional measurement, every assessment samples a relatively broad range of skills by sampling each dimension of the annual curriculum on each weekly test. Consequently, each repeated measurement is an alternate form, of equivalent difficulty, assessing the same constructs. This sampling strategy differs from typical classroom-based assessment methods, where teachers assess mastery of a single skill and, after mastery is demonstrated, move on to a different, presumably more difficult skill (see L.S. Fuchs & Deno, 1991). CBM also relies on a traditional psychometric framework by incorporating conventional notions of reliability and validity so that the standardized test administration and scoring methods have been designed to yield accurate and meaningful information.

By sampling broadly with standardized administration and scoring procedures, the CBM score can be viewed as a "performance indicator": It produces a broad dispersion of scores across individuals of the same age, with rank orderings that correspond to important external criteria, and it represents an individual's global level of competence in the domain. Practitioners can use this performance indicator to identify discrepancies in performance levels between individuals and peer groups, which helps inform decisions about the need for special services or the point at which decertification and reintegration of students with disabilities might occur.

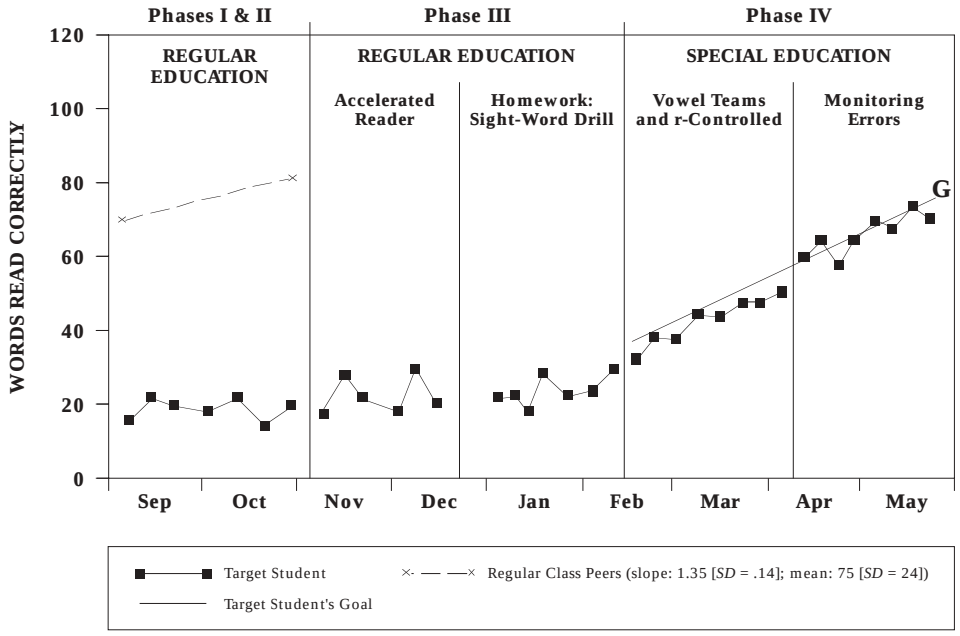
At the same time, however, CBM departs from conventional psychometric tools by integrating the concepts of standardized measurement and traditional reliability and validity with key features from classroom-based observational methodology: repeated performance sampling, fixed-time recording, graphic displays of time-series data, and qualitative descriptions of student performance. Reliance on these methods permits slope estimates for different time periods and alternative interventions for the same individual, which in turn creates the necessary database for testing the effects of different treatments for a given student. Research also suggests that, when combined with prescriptive decision rules, these time-series analytic methods result in better instruction and learning: Teachers raise goals more often and develop higher expectations (L.S. Fuchs, Fuchs, & Hamlett, 1989a); they introduce more adaptations to their instruction (L.S. Fuchs, Fuchs, & Hamlett, 1989b); and they effect better student learning (L.S. Fuchs, Fuchs, Hamlett, & Stecker, 1991).

In addition, because each assessment simultaneously samples the multiple skills embedded in the annual curriculum, CBM can yield qualitative descriptions of performance to supplement graphed, quantitative analyses of CBM total scores. These diagnostic profiles demonstrate reliability and validity (see L.S. Fuchs, Fuchs, Hamlett, & Allinder, 1989; L.S. Fuchs, Fuchs, Hamlett, Thompson, Roberts, Kubec, & Stecker, 1994), offer the advantage of being rooted in the local curriculum, provide a framework for determining strategies for improving student programs (see L.S. Fuchs, Fuchs, & Hamlett, 1994), and help teachers plan more varied, specific, and responsive instruction to meet individual student needs (L.S. Fuchs, Fuchs, Hamlett, & Allinder, 1991).

Because of these features, CBM meets four technical requirements of a treatment validity approach to identification. First, CBM has the capacity to model academic growth. With a common test framework administered to children within a fixed age range, CBM can be used to judge performance repeatedly over an academic year on the same raw score metric. Therefore, CBM provides equal scaling of individuals throughout the range of behavior measured over time on a construct and difficulty that remain constant. CBM taps constructs that are qualitatively constant over an academic year, for which the difficulty level remains the same.

Second, CBM has the capacity to distinguish between ineffective instruction and unacceptable individual learning. The effectiveness of regular classroom instructional settings can vary dramatically (L.S. Fuchs & Fuchs, 1998). Therefore, a student's responsiveness to instruction cannot be judged in absolute terms. For example, in Classroom A, where instruction is relatively ineffective, slopes are generally low, and a child with a low growth rate represents the typical level of responsiveness to the instruction provided. Classroom B, by contrast, is associated with much stronger rates of growth. Therefore, the individual rate of growth that mirrored the profile of Classroom A would suggest a lack of responsiveness to the effective learning environment represented in Class B and indicate a potential learning problem. Early evidence (L.S. Fuchs & Fuchs, 1998; Speece & Case, 2001) suggests that CBM can be used effectively to distinguish ineffective instruction from problematic individual benefit.

***Figure 1.*** Words read correctly per minute over time under the four stages of the CBM identification model.




Third, CBM informs instructional planning. A well-established, long-standing research program documents how CBM can help teachers plan better instruction and effect superior achievement. Studies have examined the effects of alternative data-utilization strategies, as well as CBM's overall contribution to instructional planning and student learning (see L.S. Fuchs & Fuchs, 1998).

The final technical requirement that CBM satisfies is evaluating treatment effectiveness. To function adequately within a four-stage eligibility assessment process, the assessment method must answer the following questions: Is the nonadapted regular classroom environment producing adequate growth? Have adaptations introduced in the regular classroom setting resulted in an improved growth rate? Has the provision of specialized services enhanced the student's learning? To answer these treatment effectiveness questions, the assessment must demonstrate sensitivity to student growth and to relative treatment effects, and it must permit comparisons of the effectiveness of alternative service delivery options. And research illustrates how CBM achieves sensitivity (Allinder & Fuchs, 1994; L.S. Fuchs Fuchs, & Hamlett, 1989b; Marston, Fuchs, & Deno, 1986) as well as comparisons across alternative service delivery arrangements (D. Fuchs, Fuchs, & Fernstrom, 1993; Marston, 1987-1988).

### Illustration of the Treatment Validity Model

We illustrate the treatment validity identification model in Figure 1 with CBM data for a fictitious second grader, Jose. Between September and November, the mean CBM performance of Jose's classroom peers was 75 words read correctly per minute (standard deviation = 24); their slope averaged 1.35 words increased per week (standard deviation = .14). Phase I assessment verified an acceptable instructional environment, as demonstrated by a classroom growth rate that conforms nicely to normative second-grade data (L.S. Fuchs, Fuchs, Hamlett, Walz, & Germann, 1993). However, Jose's CBM performance averaged only 18.1 words read correctly per minute, with a slope of -.02 correct words increased per week. This Phase II comparison placed Jose more than 2 standard

deviations below the classroom mean in terms of both performance level and slope.

Due to this dual discrepancy, the classroom teacher, in consultation with the school psychologist, engaged in Phase III assessment by developing and testing two prereferral interventions: adding Accelerated Reader (with which Jose worked at the library on reading books and answering questions about those books) and incorporating drill on sight words with homework. Unfortunately, the CBM data revealed that neither prereferral intervention substantially improved Jose's level or rate of reading improvement.

Consequently, the multidisciplinary team, which included Jose's mother, decided on a Phase IV assessment: a special education diagnostic trial for 20 minutes of daily individual reading instruction. The special education teacher first established a goal of a 2.5 word weekly increase for Jose. If met, this would result in Jose reading approximately 70 words correct at the end of the year. This desired rate of improvement appears on Jose's graph as a diagonal solid line (with "G" showing the end-of-year goal). Then, based on a phonetic analysis of Jose's current CBM reading errors, the special education teacher identified vowel teams and r-controlled words as problematic. Therefore, during an initial special education intervention, the teacher provided mnemonics instruction in decoding these two phonetic patterns, and incorporated systematic, explicit teaching for decoding these words as they appear in natural text. With this intervention, Jose's rate of growth increased to 2.46 words per week — a level greater than that of classroom peers and commensurate with the teacher's ambitious goal.

As the special educator continued to work with Jose, however, she noticed that the last three data points indicated that performance might be leveling off. Therefore, she conducted another diagnostic analysis of Jose's CBM database, this time examining the strategies Jose brought to bear in interacting with the text. The teacher noted that Jose made a high proportion of miscues that failed to preserve the meaning of the text. Consequently, the special educator designed the next intervention to address this problem: On a daily basis, Jose read into a tape recorder; listened to himself read as he reread along silently; and identified and corrected errors that failed to preserve the meaning of the text. With this intervention, Jose maintained a strong and acceptable rate of reading growth, a 2.24-word increase per week. Moreover, his performance at the end of May (65.4 words read correctly in a minute) approximated the teacher's goal of 70 words.

At this time, a decision was made that the special education diagnostic trial had proved the effectiveness of special education for Jose. The multidisciplinary team reviewed Jose's graph, along with other sources of data, to formulate a decision that an Individualized Education Plan (IEP) would be designed for Jose, which included 20 minutes of individual reading instruction each day.

## EMPIRICAL WORK SUPPORTING A TREATMENT VALIDITY APPROACH

### Research Showing Differential Rates of Responsiveness for Students with Learning Disabilities

At the core of a treatment validity approach to identification is the notion that a learning disability, in its most basic sense, is a "failure to thrive." Within this conceptualization, the student is viewed as a "nonresponder" to conventional educational treatments. Some research supports the tenability of such a proposition to characterize children identified as having a learning disability.

For example, L.S. Fuchs, Fuchs, Karns, Hamlett, Katzaroff, and Dutka (1997) examined the effects of a task-focused goals treatment on poor achievers with and without learning disabilities. Regardless of their disability status, children in the task-focused goals treatment increased their effort more than contrast students. This increased effort, however, was associated with differential learning only for low achievers without learning disabilities. The effect size for amount learned was .94 for children without learning disabilities; zero for children with learning disabilities. Differential effectiveness for low achievers with and without learning disabilities also has been documented with other treatments. For example, studies reveal a pattern of smaller effects for peer-mediated learning activities for students with learning disabilities than for nonlabeled low achievers (e.g., L.S. Fuchs, Fuchs, Hamlett, Phillips, & Bentz, 1994; L.S. Fuchs et al., 1995; L.S. Fuchs et al., 1997). Similar findings have emerged for cooperative learning (Tateyama-Snizek, 1990).

Conceptually, the phenomenon of differential effectiveness may be viewed as an aptitude-by-treatment interaction, whereby learning disability connotes some constellation of affective and cognitive states that mediates the effects of treatments. In this way, findings support the premise that learning disabilities may constitute a distinct form of low achievement, more resistant to intervention. Because research has failed to identify a useful diagnostic battery for diagnosing the constellation of affective and cognitive states, which predicts nonresponsiveness (Speece, 1990), such distinctiveness may be assessed more defensibly through a treatment validity approach.

## Research Documenting Rates of Nonresponsiveness

Some work documents rates of nonresponsiveness to otherwise effective treatments. Potentially, these rates provide insight into whether a treatment validity model for identification, whereby students are identified for special services based on their lack of responsiveness to otherwise effective teaching methods, results in the expected incidence rates for learning disabilities.

Foorman, Francis, Fletcher, Schatschneider, and Metha (1998), for example, documented the effectiveness of explicit instruction on the alphabetic code, compared to an embedded and an implicit instructional approach on the reading performance of economically disadvantaged, low-achieving first and second graders. With this effective explicit instructional method, 16% of the children remained unresponsive to treatment (compared to 44% and 46% of children in the other treatments). However, this figure of 16% is high relative to the expected incidence of learning disabilities. Nevertheless, one might assume that, with additional (Phase II, prereferral) intervention aimed at enhancing outcomes within the confines of general education support, the 16% figure could be reduced so that it more closely approximates the expected incidence of learning disabilities.

In this way, L.S. Fuchs, Fuchs, Hamlett, Phillips, and Karns (1995) randomly assigned general educators to two treatments, both of which implemented ongoing CBM as well as classwide peer tutoring in mathematics with all students in their classes beginning in September. Prior work (e.g., D. Fuchs, Fuchs, Mathes, & Simmons, 1997; L.S. Fuchs, Fuchs, Phillips, Hamlett, Karns, & Dutka, 1997) shows that students achieve better in general education settings with this combination of CBM and peer-assisted learning strategies. As with most "effective" treatments, however, some portion of students do not respond to CBM with peer-assisted learning strategies (i.e., approximately 10% of students fail to demonstrate persuasive progress; see D. Fuchs et al., 1997; L.S. Fuchs et al., 1994).

Because of the need to focus more carefully on students who manifest unacceptable performance and growth, the second treatment in this study focused on individual adaptations conducted in regular classrooms, as might be conceptualized with Phase II assessment. Beginning in November, the bimonthly CBM class reports identified up to two target students per class whose CBM progress was inadequate (i.e., low level combined with low slope relative to classmates). For these students, teachers (a) formulated an adaptation before the next two-week report; (b) implemented that adaptation at least four times in the upcoming two weeks; and (c) when CBM identified the same student multiple times over reports, modified previous adaptations to enhance progress.

Nevertheless, despite many focused, data-based attempts to enhance learning, some children proved unresponsive to regular classroom adaptations. Two cases illustrate students' differential responsiveness. Over a 12-week period, a fourth-grade teacher implemented a rich set of adaptations, relying on basic facts drill, motivational workcharts and contracts, and manipulatives. The target student, who exhibited a CBM slope of .21 digits per week when identified for adaptation, responded well to these modifications to the regular classroom and completed the school year with a slope of .63 digits per week — the average slope for the class. This success contrasts with the experience of a third-grade teacher who also implemented a large number and rich set of adaptations, including drilling basic facts, slicing back to second-grade material, implementing a motivational workchart, and using money to work on conceptual underpinnings. Despite this teacher's similar level of effort to modify regular classroom instruction, her target student demonstrated little improvement in growth rate: He ended the year with a relatively low slope of .28 digits per week, which was similar to his slope at the time he was identified for adaptation, and which was considerably lower than his classmates' average weekly slope of .98 digits.

In all, teachers effected substantial improvement for 33% of their target students, who had been identified on the basis of dual discrepancies. This suggests that, with the assistance of rich assessment information and consultative support to formulate feasible adaptations, regular classroom teachers may address the problems of some portion of students who initially demonstrate significant learning discrepancies from classroom peers. If we multiply the estimate of initial levels of unresponsiveness to CBM and peer-assisted learning strategies (10%) with the estimate of those who remain unresponsive with additional classroom adaptation (100% of initial unresponders minus 33% who proved responsive with adaptations = 77%), we arrive at a figure of 7.7%. This better approximates the incidence of learning disabilities.

## Research on a Treatment Validity Approach to Identification

Some researchers have examined more directly the tenability of a treatment validity model for identification. For example, Vellutino and colleagues (1996) identified children who demonstrated early signs of reading problems, as judged by their first-grade teachers in November. A subsample of 74 poor readers received individual daily tutoring for 15 weeks. A linear regression was run for each child using time in months

between kindergarten and fall of second grade as the independent variable and reading scores as the dependent variable. From these data, Vellutino et al. estimated slopes to represent each child's reading growth. On the basis of these slopes, the tutored poor readers were classified further in terms of treatment responsiveness. Vellutino et al. then described one group of poor readers as the "difficult to remediate" children and, on the basis of results, argued that treatment provided a "first-cut diagnostic" in distinguishing between disabled and nondisabled learners. This approach is consistent with the notion of learning disability as a failure to thrive; the diagnostic framework conforms nicely to a treatment validity perspective on identification.

### Research Examining the Tenability of a Dual Discrepancy

Dual discrepancy as an index of "failure to thrive" has considerable intuitive and empirical appeal. Such an index deals directly with the problem at hand (e.g., poor reading, poor math skills), reflects a dynamic rather than a static approach to learning and assessment, and is data based. However, it requires a seismic shift in beliefs, attitudes, and practice. The details of ideally implementing the treatment validity model with dual discrepancy include (a) assessing every child in every classroom every week, (b) evaluating progress on a regular basis, (c) formulating interventions within general education classrooms for children identified as dually discrepant, (d) implementing the interventions with fidelity, and (e) evaluating the effects of the intervention. Clearly, the treatment validity model requires much effort and vigilance, especially compared to diagnostic procedures that rely on identification of IQ-achievement discrepancies or simple low achievement. The question becomes, "Is it worth it?"

One way of addressing this question is through comparison with other identification procedures. Speece and colleagues (Speece & Case, 2001; Speece, Molloy, & Case, 2000) compared the dual discrepancy method to IQ-reading achievement discrepancy and low reading achievement definitions of reading disabilities in an epidemiological sample of first- and second-grade children to assess the validity of the dual discrepancy approach. Only the validity of using dual discrepancy as a marker of reading disability was assessed. This corresponds to Phase II of the treatment validity model in which children are identified as being below their classmates on level and rate of progress. However, the determination of dual discrepancy status was based on CBM oral reading fluency measures collected across approximately six months of a school year. This approach was taken to reflect reading problems that were likely more severe than those based on several weeks, as proposed in the initial problem certification phase of the four-phase treatment validity model.

The population ($N$ = 694) was screened on CBM letter-sound fluency (first grade) and oral reading fluency (second grade) probes to identify at-risk ($N$ = 144) and purposive ($N$ = 129) samples. The at-risk children comprised the lowest 25% of children in each classroom. To form the purposive sample, five children representing a range of skill above the 30th percentile on the screening measures were selected from each classroom. The at-risk and purposive sample children were followed across the school year and were administered a minimum of 10 CBM oral reading fluency probes to determine dual discrepancy status (CBM-DD). Other measures of intelligence and reading achievement were used to form the IQ-reading achievement discrepancy (IQ-DS) and low reading achievement (LA) groups. Validation measures included several phonological processing variables, teachers' ratings of academic competence, problem behaviors, and social skills, age, gender, and race.

The poor reader groups were formed hierarchically. All children who exhibited a dual discrepancy were assigned to the CBM-DD group. The remaining children who met the classification criteria were assigned to the IQ-DS group for the first set of comparisons and to the LA group for the second, and parallel, set of comparisons. Using these procedures, 47 children were identified as CBM-DD, 17 as IQ-DS, and 28 as LA. The prevalence of CBM-DD was 8.1% compared to 5.9% for IQ-DS (based on all children who met the classification criteria regardless of whether they qualified for either of the other groups). By definition, the LA group would reflect approximately 25% of the population because we used a standard score below 90 on a norm-referenced measure as the criterion. Thus, it appears that the CBM-DD procedures are likely to identify a reasonable number of children with interventions implemented as proposed in the full treatment validity model. It should be noted that the CBM-DD group obtained significantly lower reading scores compared to the at-risk and purposive sample children not classified as poor readers.

Comparisons between the poor reader groups on the continuous measures are reported as effect sizes in Table 1. The CBM-DD group, compared to IQ-DS, was more impaired on every measure with the exception of reading and word reading efficiency. There were fewer and more modest differences between CBM-DD and LA. Notably, the CBM-DD group had poorer phonological awareness skills at second grade and were rated lower on academic competence, problem behaviors, and social skills. Interestingly, the four cross-sectional comparisons that used grade (including IQ-DS) indi-

cated that CBM-DD children may become more impaired over time (age could not be used as a covariate in the inferential analyses because the assumptions of the test were not met). It is notable that the CBM-DD group was younger than either of the other poor reader groups. This finding has implications for early identification and intervention, which is a major educational conundrum (Good, Simmons, & Kameenui, 2001; Lyon, 1995).

Not reflected in Table 1 are the results for race and gender. All three methods included equal numbers of females and males (approximately 50-50), likely because research criteria were used to form the groups. For both the CBM-DD and LA groups, racial distributions reflected the proportions of majority and minority children in the schools. The IQ-DS group included a disproportionately high number of majority children

Messick (1989, 1995) proposed that validity be judged relative to the meaning (construct validity, relevance and utility) and use (social consequential validity and values) of test scores, broadly defined. In the present case, *scores* refer to classification as dually discrepant. The data presented by Speece and Case (2001) are most relevant to construct and social consequential validity.

The group comparisons support construct validity in that the CBM-DD group demonstrated more problems in skills that underlie beginning reading. Further, teachers viewed CBM-DD children as less academically competent and as exhibiting more social and classroom problem behaviors. These effects were stronger in comparison with IQ-DS than with LA. However, small effect sizes (i.e., .20) are not trivial (Cohen, 1992). Further, the dual discrepancy method demonstrated social consequential validity in that decisions to identify children in this manner would reflect gender and racial equity. Also, the children were younger, a consequence valued by educators, and considerably fewer were identified compared to a low achievement definition. The CBM-DD classification was the only one of the three methods to reflect favorably the three social consequences that were investigated (gender and racial equity, early identification).

In response to the question, "Is it worth it?," we suggest the answer is "yes," keeping in mind that demonstration of validity is an ongoing process (Messick, 1995). Another important question is whether the reading disability community, and by extension the learning disability community, can embrace the implications of the model (assuming that additional evidence can be marshaled). As noted earlier, the model requires a great deal of change, which is not a defining feature of American education (Tharp & Gallimore, 1988). As research is completed with respect to validity, we need to ask if and how changes may be implemented in the service of more valid procedures.

**Table 1**

***Effect Sizes Calculated Between the CBM Dual Discrepancy Group and Two Other Poor Reader Groups***

| Variable | IQ-DS | LA |
|---|---|---|
| Intelligence | -1.55 | -.19 |
| Age | -1.16 | -.69 |
| Reading | -.10 | .17 |
| Fall Word Reading Efficiency | -.01 | .24 Grade 1 |
| | | .08 Grade 2 |
| Fall Rapid Object Naming[a] | .50 | -.08 |
| Spring Phonological Awareness | .50 Grade 1 | -.15 Grade 1 |
| | -1.39 Grade 2 | -.84 Grade 2 |
| Academic Competence | -.71 | -.29 |
| Problem Behavior[a] | .54 | .21 |
| Social Skills | -.57 | -.29 |

*Note.* Adapted from Speece and Case (2001). Positive effect sizes favor the CBM Dual Discrepancy Group. IQ-DS = group defined by the regression-based discrepancy between intelligence and reading achievement; LA = group defined by low (< 90) reading achievement.

[a]Low scores are desirable; thus positive effect sizes favor the IQ-DS or LA groups.

## THE CONTROVERSIAL FOURTH PHASE: REQUIRING SPECIAL EDUCATION TO DEMONSTRATE ADDED VALUE PRIOR TO PLACEMENT

### The Rationale for a Fourth Phase

As originally proposed, the treatment validity model for identification includes a fourth phase, which requires that the added value of special education be demonstrated before a child qualifies for special services. The decision to include this fourth phase was motivated by two concerns.

The first is *minority student overrepresentation within special education*. As mentioned, the NRC's analysis (Heller et al., 1982) of overrepresentation reformulated the problem from one of reducing disproportionality to that of determining the conditions under which inequality constitutes treatment inequity. According to Messick (1984), disproportion signifies inequity only when children are unduly exposed to classification because they receive poor-quality regular education, are assessed invalidly for special education, or receive an ineffective special education that hinders their educational progress. The fourth phase of a treatment validity approach to identification addresses Messick's last point. This fourth phase strives to eliminate the inequity potentially associated with overrepresentation of minority students in special education by reserving judgment about the need for special education until evidence verifies that a special education program enhances learning. If, on the other hand, special education effectiveness at the individual level cannot be documented, no compelling rationale exists for assigning a learning disability label or removing the child from the classroom for instruction. So, equity is achieved when, prior to placement, evidence verifies that special education is valuable and desirable because it enhances the learning of the individual. Consequently, this fourth phase of the assessment process may be important to the achievement of equity.

The second rationale for a fourth phase of decision making within a treatment validity approach is to encourage *special education accountability*. In 1995, when the treatment validity model was originally proposed, the general education reform movement was (and continues to be) driven by accountability for children's achievement of high standards. And the focus on statewide assessment programs, with strong consequences to schools for student learning, was gaining momentum. In special education, however, no parallel push for accounting for student outcomes was occurring. Even today, with the amendments of the Individuals with Disabilities Education Act's requirement that all students with disabilities participate in the general education accountability system, serious questions remain about the nature and force of accountability for the achievement of students with learning disabilities. For example, it is unclear whether the content of the state assessments adequately addresses the acquisition of basic reading and mathematics competence, which constitutes the heart of the instructional programs of most students with learning disabilities (see Fuchs & Fuchs, 2000, for discussion). In addition, the many unanswered questions about accommodations on high-stakes, group-administered tests raise concerns about whether performance on these assessments validly represents outcomes for students with learning disabilities (see, for example, Koretz & Hamilton, 2000).

Alternatively, with a diagnostic special education trial, which serves to assess the added value of special education services, accountability for special education is addressed using the very learning outcomes that created concern in the first place. That is, if a student is identified for special attention because he or she manifests a dual discrepancy in reading that proves resistant to adaptations within the regular classroom, then special education accountability is demonstrated when the student's rate of reading growth improves, as revealed by the same assessment device through which treatment unresponsiveness initially was documented. In this way, the fourth phase within a treatment validity approach to identification creates important consequences associated with special education accountability: If special education is to exist (i.e., is to have students to serve), special education must demonstrate its added value on the front end, prior to placement.

### Arguments Against a Fourth Phase

Despite the salience of overrepresentation and accountability issues in support of a fourth phase, two counterarguments are compelling. First, among the students who enter a fourth phase (those who manifest dual discrepancies that prove resistant to general education adaptations), those who respond favorably within the limited timeframe of a diagnostic special education run may represent false positives. At the same time, the children who fail to respond within a limited timeframe to the more intensive, individualized forms of instruction available within special education may represent the population of learners for whom special education is most necessary — those who, in fact, have the serious underlying deficits that a disability denotes. In this way, the children who are identified via a fourth phase (those who *do respond*) may be the very children who should be *excluded* from consideration. And, in a complementary way, those who are excluded from a special education (those who

*do not respond*) may be the *appropriate* candidates for special education.

The second argument against the fourth phase of the treatment validity model also concerns students who reveal serious learning problems in Phases II and III, but fail to demonstrate enhanced growth with special education and, therefore, do not meet eligibility requirements. Given a straightforward implementation of this decision-making process, these students are returned to the regular classroom without additional support when, clearly, some action is required. And both arguments inevitably lead to the conclusion that special education is most appropriate for the very children it cannot help. Alternatively, however, these difficulties with the fourth stage of the treatment validity identification model lead to a model that attempts to address these conceptual and operational problems.

### A Revised Treatment Validity Model

Addressing the difficulties associated with the original model's fourth phase, while capitalizing on its potential, requires revision. In implementing the treatment validity model recently within a Nashville public school, we revised the last phase in the following way. We referred to the revised last phase of the identification model as an "extended assessment plan." Consistent with the original model, this extended assessment plan includes a diagnostic special education trial (approved by the multidisciplinary team on which the parent participates), and is designed to assess the potential contribution of special education to the student's learning. During the diagnostic trial, the use of CBM continues to determine whether special education reduces the student's dual discrepancy. No later than eight weeks into this phase, the team reconvenes with the parent to review the diagnostic CBM data. When successful student progress has been demonstrated within the diagnostic trial period, the successful intervention continues to be implemented, and an IEP is developed to continue and to enhance the program.

When differential progress is not demonstrated during the diagnostic trial period, however, the child is not simply returned to regular education without the benefit of additional intervention. Instead, assessment continues. The assessment team, in collaboration with the parent(s), reviews options and collects additional assessment information with which to describe and address the dual discrepancy. These options include, but are not limited to: (a) placing the student in general education with accommodations that teach the student how to access the general education curriculum in effective ways despite basic skill limitations; (b) continuing the diagnostic trial period for a designated period of time; (c) continuing the diagnostic trial period in a more restrictive placement that offers additional resources for effecting progress; and (d) continuing the special education diagnostic trial in another school where other special educators or alternative resources are available to address the student's needs.

In this way, an unsuccessful Phase IV diagnostic special education trial might lead to the identification of students for whom alternative curricula are appropriate, where literacy or numeracy goals are deemphasized and where the use of prosthetic devices to overcome handicaps might assume priority. Alternatively, an unsuccessful diagnostic special education trial could lead school districts to proactively consider and empirically test results associated with more intensive models of special education. Regardless of which option is selected, the student's progress continues to be monitored via CBM: When the student is returned to general education, CBM is used to problem solve on the student's behalf; when the diagnostic trial is extended, CBM is used to assess whether a data-based rationale can be mounted on behalf of special education; and when an IEP is opened, CBM is used to develop an optimal plan in response to the student's actual progress and to determine the earliest opportunity for productively exiting the student from special education.

With these modifications, the last stage of the treatment validity model provides a more flexible system of alternatives for problem solving. It avoids the problematic situation where students who fail to respond quickly within a diagnostic special education trial are matter-of-factly returned to regular education without additional support. At the same time, the last stage of the treatment validity model also sets the stage for districts to develop an array of alternative responses to students who fail to demonstrate progress — rather than to permit the most difficult-to-teach students to languish in ineffective instructional settings. Moreover, progress is monitored continuously, and decisions are formulated about entry to special education based on these accountability data, which have the capacity to reveal special education's value. And finally, once placement decisions are made, progress is monitored continuously so that decisions about exiting special education can be formulated responsively.

## CONCLUDING COMMENT

The revised treatment validity model provides four guarantees. First, special education decisions are formulated on the basis of students' lack of responsiveness to instruction, in the face of dual discrepancies that prove resistant to prereferral adaptations; second, the diagnostic process provides evidence that special education benefits the students it serves; third, a flexible

problem-solving system permits consideration of alternative responses when the diagnostic special education trial reveals continued unresponsiveness; and fourth, students exit special education as soon as objective data indicate that they can make adequate progress within the confines of regular education. In these ways, a treatment validity model, which includes the proposed revision to its final stage, should simultaneously provide a stronger conceptual framework and technical basis for identifying students as having learning disabilities, while avoiding the controversy associated with disproportionate representation of students of color within special education.

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## NOTES

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**Winner of CLD's 2000 Award for Outstanding Research**

*The following article was selected by CLD's Research Committee as the winner of the 2000 Award for Outstanding Research. Presented annually, the award is designed to promote and recognize doctoral or master's level research conducted within the last five years. Winners receive a certificate and a cash award during the Distinguished Lecture at the International Conference on Learning Disabilities sponsored by the Council for Learning Disabilities. Jill Howard Allor received this award on Saturday, October 21, 2000 during CLD's 22nd International Conference in Austin, Texas.*

# THE RELATIONSHIPS OF PHONEMIC AWARENESS AND RAPID NAMING TO READING DEVELOPMENT

***Jill Howard Allor***

***Abstract*. This article describes and summarizes research studies that analyze the shared and unique contributions of phonemic awareness and rapid naming to reading development. Three questions were addressed. Does phonemic awareness account for a proportion of the variance in reading development that is not accounted for by rapid naming? Conversely, does rapid naming account for a proportion of the variance not accounted for by phonemic awareness? Finally, do phonemic awareness and rapid naming contribute differentially to various subskills of reading development? Findings of the studies and implications for future research are discussed.**

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It is widely accepted that the most common type of reading problem for students with reading disabilities, or dyslexia, is their inability to accurately and fluently identify printed words (Ehri & Wilce, 1983; Gelzheiser & Clark, 1991; Torgesen & Wagner, 1998). Additionally, researchers generally agree that this inability is a primary cause of comprehension problems in elementary-aged children as well as older children who continue to struggle with decoding (Stanovich, 1991). For this reason, it is critical to ascertain the causes of word reading difficulties in order to identify these problems and provide appropriate instruction as early as possible.

Fortunately, researchers have identified several phonological processing variables important for the early identification of students with reading disabilities (Torgesen & Wagner, 1998). Knowledge of these phonological processes is also improving theory about reading development and reading disabilities. Phonological processing is the ability to understand and use the sound system of our language to process

written and oral information (Jorm & Share, 1983; Wagner & Torgesen, 1997). One example of phonological processing is phonological awareness, which is the understanding that sentences are made up of words, words are made up of groups of sounds (syllables), and syllables are made up of individual sounds, or phonemes. This concept is often confused with tasks involving print; however, phonological awareness is an oral language skill that is a prerequisite for understanding the relationship between sounds and print. That is, without adequate phonological awareness, a student is unable to blend sounds together to form words or to segment words into their individual sounds. The student may recognize letters and say their corresponding sounds, but will have difficulty using that information to completely process a word. Phonemic awareness (phonological awareness at the phoneme level) is now accepted as not only a strong predictor of future reading ability, but also as a primary cause of word-level reading difficulties (Torgesen & Wagner, 1998). Studies have clearly demonstrated that phonemic awareness instruction results in improved phonemic awareness skills, more rapid response to beginning reading instruction, and improved subsequent reading development (Byrne & Fielding-Barnsley, 1993; Cunningham, 1990; O'Connor, Jenkins, Leicester, & Slocum, 1993; Tangel & Blachman, 1992).

Another phonological variable that has been studied extensively is rapid naming, or lexical retrieval, which is the ability to retrieve phonological codes stored in long-term memory. An individual's efficiency with this task is measured by the amount of time needed to name stimuli (number, letter, color, or common object) when presented either in isolation or serially. Serial tasks are most commonly used and are often called "rapid automatized naming" tasks, or RAN. The research base that connects rapid naming to reading is quite extensive. Naming tasks have been shown to be highly correlated to reading ability (Wolf, 1991).

Researchers agree that rapid naming is an important predictor of growth in word-level reading and that these tasks are likely to be useful in the diagnosis of particular kinds of reading problems in individual children (Torgesen et al., 1997; Wolf, 1991). Some researchers hypothesize that students with deficits in both phonemic awareness and rapid naming are likely to have the most serious reading disabilities (Blachman, 1994; Bowers & Wolf, 1993; Torgesen, Wagner, & Rashotte, 1994). This is referred to as the "double-deficit hypothesis." Moreover, other researchers hypothesize that phonemic awareness and rapid naming contribute differentially to various components of the reading process (Bowers, 1995; Cornwall, 1992). Questions have been raised about whether rapid naming provides predictive information above and beyond that of phonemic awareness. In other words, if we already know how a child performs on phonemic awareness tasks, do we learn more about the child's future reading ability if we assess her performance on rapid naming tasks? And, if we do learn more, exactly what additional information do we gain from assessing rapid naming?

These questions are being answered in studies that include measures of both phonemic awareness and lexical retrieval as important diagnostic markers of reading disabilities (Torgesen & Wagner, 1998). It is important that we understand their overlapping and unique contributions to the reading process, so we can more efficiently identify students with reading disabilities and refine theories about how they develop reading skills. Improved theories, in turn, should lead to improved instructional methods. Thus, by understanding the relationships of these two variables to developmental reading disabilities, we will be better equipped to identify these students as early as possible and meet their instructional needs more efficiently and effectively.

The purpose of this article is to synthesize the results of studies that analyzed the shared and unique contributions of phonemic awareness and rapid naming tasks in predicting reading ability. Three specific questions were addressed: (a) Does phonemic awareness account for a proportion of the variance in reading development that is not accounted for by rapid naming? (b) Does rapid naming account for a proportion of the variance not accounted for by phonemic awareness? and (c) Do phonemic awareness and rapid naming contribute differentially to various subskills of reading development? After describing the methods used to locate studies, I will summarize the results of the studies and address each research question. Finally, I will present conclusions and discuss implications for future research.

## LITERATURE SEARCH

The goal of the literature search was to locate studies that included at least one measure of phonemic awareness, rapid naming, and reading so that conclusions could be drawn about the relative contributions of phonemic awareness and rapid naming to reading development. All studies selected included multivariate analyses of the proportion of variance that might be uniquely attributable to individual differences in phonological awareness and rapid naming. The multivariate analyses were not the primary analyses in all studies, particularly those with smaller sample sizes. In this article, I will report only on the portions of the studies that directly address relative contributions of phonemic awareness and rapid naming.

To locate applicable studies, I conducted a computer search of ERIC using the following descriptors: "reading

**Table 1**
***Subject Descriptions***

| Study | *N* | Description |
|---|---|---|
| Ackerman et al., 1993 | 119 | ages 7.5-12 years, compares dyslexic vs. slow learner vs. ADD only |
| Badian, 1993a | 170 | ages 6-10, all tested for possible special education services |
| Badian, 1993b | 71 | ages 7-8, followed up after at least one school year of special help in reading |
| Blachman, 1984 | 46, 48 | 46 kindergarten students and 48 first-grade students (all innercity, minority) |
| Bowers, 1993 | 37 | same sample as Bowers, 1995; new analysis on repeated readings |
| Bowers, 1995 | 38 | followed from Grade 2 to Grade 4, middle class (20 "poor" readers and 18 "average" readers) |
| Bowers et al., 1991 | 46 | 2nd-grade, middle-class students with "moderate" to "severe" reading problems |
| Catts, 1991 | 41 | students with language and/or speech impairments followed from kindergarten to 1st grade |
| Cornwall, 1992 | 54 | 7-12 years of age, students with reading disabilities |
| Cronin & Carver, 1998 | 95 | primary (kindergarten age) and 1st grade at beginning of study, followed for one year |
| Ellis, 1990 | 40 | students followed from age 5 to 7 |
| Felton, 1992 | 215 | "at-risk" students followed from kindergarten to 3rd grade |
| McBride-Chang & Manis, 1996 | 125 | 3rd and 4th grade, 51 "poor" and 74 "good" readers |
| Torgesen et al., 1997 | 201 | followed from 2nd grade to 5th grade (comparisons made from 2nd-4th and 3rd-5th) |
| Wagner et al., 1994 | 214 | students followed from kindergarten through 2nd grade |
| Wagner et al, 1997 | 216 | students followed from kindergarten through 4th grade |

disabilities and memory," "reading disabilities and phonological processing," "lexical retrieval and reading," and "rapid naming and reading." Additional studies were located as I reviewed these articles and selected references discussed by the authors. These efforts generated a total of 16 articles. Table 1 lists these articles and describes the subjects in each study. Table 2 lists the measures administered in each study. Of the 16 articles, five were large-scale, longitudinal studies (Cronin & Carver, 1998; Felton, 1992; McBride-Chang & Manis, 1996; Torgesen, Wagner, Rashotte, Burgess, & Hecht, 1997; Wagner, Torgesen, & Rashotte, 1994; Wagner et. al, 1997). Three were not longitudinal, but analyzed relative large samples, ranging from 119 to 170 students (Ackerman & Dykman, 1993; Badian, 1993a; McBride-Chang & Manis, 1996). The remaining studies were smaller (Badian, 1993b; Blachman, 1994; Bowers, 1993, 1995; Bowers et al., 1991; Catts, 1991; Cornwall, 1992).

## FINDINGS OF STUDIES

### Large-Scale, Longitudinal Studies

**Torgesen, Wagner, and colleagues.** Wagner and Torgesen and their colleagues collected data on a large sample of kindergartners and have followed their progress through 5th grade (Torgesen et al., 1997; Wagner et al., 1997; Wagner et al., 1994). Initially, 284 subjects were randomly selected from kindergarten classrooms in six schools. In the final analysis reported (Torgesen et al., 1997), 201 subjects remained in the sample. In each of the studies, multiple measures of phonological processing skills, including phonemic awareness and rapid naming, were used to determine either latent variables or composite scores. Additionally, subjects were given the word identification and word attack subtests of the *Woodcock Reading Mastery Tests-Revised*. Scores on these subtests were combined to form one score in word recognition.

In Wagner et al. (1994), latent variables of phonological analysis (phonemic segmentation), phonological synthesis (phonemic blending), and rapid naming were included in a structural equation model to determine whether the causal influences of phonological processing skills were redundant or independent. When these variables were considered as a whole, only phonological analysis and word recognition in kindergarten contributed significantly to word recognition in first grade. Correlation coefficients were .75 for phonological analysis and .35 for prior word recognition ability ($p < .001$). When this analysis was completed for first-grade phonological processing to second-grade word recognition, similar results were obtained, with one exception: Phonological synthesis, rather than analysis, contributed significantly. Correlation coefficients were .22 for phonological synthesis and .47 for prior word recognition. However, phonological synthesis and phonological analysis were highly correlated, so most of the contributed variance was shared between the two variables. Both were good predictors, but one was somewhat better.

In a followup study of the same sample, Wagner et al. (1997) found similar results. As in the previous study, individual differences in phonological awareness contributed uniquely and significantly to subsequent differences in word recognition. However, in the later study, rapid naming also contributed uniquely in some of the time periods analyzed. The data were analyzed by examining overlapping, two-year blocks of time (kindergarten to second grade, first to third grade, and second to fourth grade). At each level, prior ability in word recognition was used as an autoregressor in order to determine the impact of each variable on any word reading growth that occurred during that specific period of time. Correlation coefficients for phonemic awareness ranged from .27 to .39 and were all significant ($p < .001$). Correlation coefficients for rapid naming were significant in the first two time periods (kindergarten to second and first to third), but not from second to fourth. These were .25 ($p < .01$), .21 ($p < .01$), and .07 (not significant), respectively.

In a separate article, Torgesen et al. (1997) examined the impact of both phonological awareness and rapid naming on several measures of reading ability, including word identification, word attack, comprehension, and timed word identification. Differences were studied across two developmental periods, from second to fourth grade and from third to fifth grade. These time periods were selected because growth in word reading skill is typically rapid for students in these grades. As in the Wagner et al. (1997) study, an autoregressor of previous word recognition was used. Phonological awareness in second grade accounted for unique and significant differences in word identification, word attack, and reading comprehension in fourth grade. Correlation coefficients were .03 ($p < .01$), .06 ($p < .001$), and .03 ($p < .01$), respectively. Similar results were obtained when the third-grade scores were compared to fifth-grade scores. These correlation coefficients were all .02 ($p < .05$). In fifth grade an additional measure of reading speed was included in the analysis, but neither phonological awareness nor rapid naming contributed significantly to variations on this test. Contributions of rapid naming (beyond initial levels of word recognition ability and phonemic awareness) were insignificant at each time period with one exception: Rapid naming in second grade contributed uniquely to word attack in fourth grade, but the coefficient was extremely low, .01 ($p < .05$).

These analyses were repeated for students scoring below the 20th percentile on the word identification subtest ($n = 43$) in second grade. The primary difference in their scores was that phonological awareness in second grade played a larger role in explaining growth in word recognition and reading comprehension, with correlation coefficients of .14 ($p < .01$) and .19 ($p < .001$), respectively. When phonological awareness in third grade was compared to the reading outcomes in fifth grade, the only significant finding was for word attack, with a correlation of .07 ($p < .05$). Rapid naming did not contribute significantly in any of these analyses.

**Felton, 1992**. Another large-scale, longitudinal study was conducted by Felton (1992). This study included 215 students, who were tested on measures predictive of reading in kindergarten and on reading skill in third grade. Students considered to be "above average or superior" by their teachers and those who scored below 80 (standard score) on the *Otis-Lennon Mental Abilities Test* were excluded from the sample. The reading outcome measure was the *California Achievement Test*, a multiple-choice test composed of vocabulary and comprehension subtests. At the end of their third-grade year, the students were placed in one of four categories based on their reading scores: severely disabled readers (scores at or below the 5th percentile), mildly disabled readers (scores from the 6th to the 16th percentile), average readers (scores from the 17th to the 83rd percentile) and superior readers (scores at or above the 84th percentile).

A stepwise discriminant function analysis was computed on the total kindergarten test battery to determine which variables were the best predictors of group membership. Three variables were selected for entry — general ability (IQ), rapid naming of letters (RAN), and a phonemic awareness task (PA; phonemic sensitivity to initial consonants). These accounted for 41% of the variance in reading outcome, which included 7% for

**Table 2**
***Measures Administered in Studies***

| Study | Phonemic Awareness | Rapid Naming | Reading |
|---|---|---|---|
| Ackerman & Dykman, 1993 | phonemic – sensitivity | numbers, letters alternating (NL) | word identification, word attack |
| Badian, 1993a | phonemic – deletion | objects, colors, numbers, letters | word identification, word attack, comprehension |
| Badian, 1993b | phonemic – deletion | objects, colors, numbers, letters | composite (word identification, word attack, and comprehension) |
| Blachman, 1984 | phonological – syllable segmentation (K-1)<br>phonemic – rhyming (K-1), segmentation (1st) | objects, colors, numbers | word identification (K & 1st)<br>regular word identification (1st) |
| Bowers, 1993 | phonemic – deletion | numbers | oral reading fluency of passage |
| Bowers, 1995 | phonemic – sensitivity, deletion | numbers, letters | word identification, word attack, comprehension |
| Bowers & Swanson, 1991 | phonemic – sensitivity, deletion | numbers | word identification, word attack, comprehension |
| Catts, 1991 | phonemic – deletion, blending | objects, colors, animals | word identification, word attack |
| Cornwall, 1992 | phonemic – deletion, blending | colors, letters | word identification, word attack, fluency, comprehension, spelling |
| Cronin & Carver, 1998 | phonemic – sensitivity | numbers, letters | composite (word identification, word attack, word comprehension, passage comprehension) |
| Ellis, 1990 | phonological – syllable segmentation<br>phonemic – segmentation | colors | word identification, word attack, comprehension |
| Felton, 1992 | phonological – syllable counting<br>phonemic – sensitivity, segmentation | objects, colors<br>numbers, letters | composite (vocabulary and comprehension) |
| McBride-Chang et al., 1996 | phonemic – deletion, segmentation | numbers, letters | composite (word identification and irregular word identifcation) |
| Torgesen et al., 1997 | phonemic – deletion, segmentation, blending | numbers, letters | word identification, word attack, comprehension, timed word identification |
| Wagner et al., 1994 | phonemic – sensitivity, deletion, segmentation, blending | alternating (NL) numbers, letters | word recognition (combined word identification and word attack), |
| Wagner et al., 1997 | phonemic – sensitivity, deletion, segmentation, blending | numbers, letters | word recognition (combined word identification and word attack) |

PA, 20% for RAN, and 14% for IQ. An additional stepwise procedure was computed with the IQ data removed. This procedure again selected rapid naming of letters and phonemic awareness; variance was reduced to 32% (PA, 12% and RAN, 20%). Ninety-seven percent of the good readers (in third grade) were accurately predicted to be at no risk for reading difficulty, and only 3% of those predicted to be at no risk were incorrectly classified as poor readers. These results establish the consistent significance of phonemic awareness and rapid naming in accurately predicting reading achievement in the early grades.

**Badian, 1993b.** Badian (1993b) conducted a relatively large-scale, longitudinal study that followed 71 subjects for two years. At the beginning of the study, the subjects were approximately 7-8 years old and all had been identified as needing "special help" in reading. Initially, the subjects included 30 relatively "good" and 41 "poor" readers. Poor readers were students who scored below the 25th percentile (based on age) on both word identification and word attack, or below the 12th percentile on either word identification or word attack. Mean standard scores for the good readers were 93.1 and 93.3 for word identification and word attack, respectively. Poor readers' mean standard scores were 80.5 and 81.4. All students were taught using a multisensory phonetic approach. At followup, the reading status for some subjects changed. As a result, the sample was made up of 41 relatively good and 30 poor readers. Mean standard scores for good readers at followup were 95.9 and 98.4; for poor readers, scores were 80.9 and 84.2. Multiple-regression analyses were conducted, with IQ and age entered prior to other variables, which included phonemic awareness, rapid naming of numbers, the *Jordan Left-Right Reversal Test*, and the *Boston Naming Test*. After IQ and age were accounted for, phonemic awareness, rapid naming, and the *Jordan* contributed uniquely and significantly to a composite reading measure. These variables accounted for 31.8% of the variance, with phonemic awareness accounting for 6.1% and rapid naming for 4.6%.

**Cronin and Carver, 1998.** Cronin and Carver (1998) conducted a relatively large-scale, longitudinal study and found similar results. They followed 95 students for two years. In the first year of the study, 57 students were kindergarten age and 38 were in the first grade. Students were tested in the fall and spring of the initial year of the study and again in the spring of the second year. The *Peabody Picture Vocabulary Test-Revised* (PPVT-R) was administered at the first session only; phonemic awareness and rapid naming measures were administered in the first two testing sessions; and the reading measures were administered at all three testing sessions. The reading outcome analyzed was a composite score of subtests of the *Woodcock Reading Mastery Tests-Revised*, which included word identification, word attack, word comprehension, and passage comprehension. Hierarchical regression analyses were conducted, with the PPVT-R scores and grade level entered first to control for these factors. Phonemic awareness and rapid naming were entered next, accounting for 30% ($p < .001$) and 4.8% ($p < .001$) of the variance in reading scores.

### Large-Scale Studies

**Ackerman and Dykman, 1993.** Ackerman and Dykman (1993) studied a sample of 119 children, ages 7.5 to 12 years, who had been referred to a clinic for testing and had IQ scores > 80. The authors did not follow these students longitudinally, however. The sample included 56 children with attention deficit disorder and no reading disabilities, 42 students with reading disabilities (full-scale IQs at least 17 points higher than their reading/spelling average), and 21 poor readers (less than a 17-point discrepancy). Stepwise regression analyses were used to predict scores on word identification and word attack tests. After age and IQ were accounted for, phonemic awareness and rapid naming were found to make unique and significant contributions to the variance on both measures. Rapid naming measures were entered before phonemic awareness, yielding 14% of the variance on word identification and 11% on word attack. Phonemic awareness accounted for 3% and 5% of the remaining variance, respectively.

**Badian, 1993a.** Badian (1993a) also examined a large sample of children who had been referred for testing, but did not follow them longitudinally. Subjects were 170 children, ages 6 to 10, referred to a school district. IQs fell between 80 and 130. Mean standard scores on subtests of the *Woodcock Reading Mastery Tests-Revised* ranged from 88.5 (*SD* 10.4) to 89.5 (*SD* 10.9). Hierarchical regression analyses were conducted on word identification, word attack, and passage comprehension scores. With full-scale IQ and number of years of reading experience accounted for, phonemic awareness, rapid naming, and the *Jordan Left-Right Reversal Test* all made significant and unique contributions to the variance, regardless of order of entry. On word identification, rapid naming of numbers accounted for most of the additional variance. Depending on the order of entry, percentages ranged from 7.6 to 16.6 for rapid naming of numbers, 2.0 to 5.9 for phonemic awareness, and 5.8 to 13.1 for the *Jordan*. On word attack, phonemic awareness accounted for most of the additional variance. Specifically, percentages ranged from 12.4 to 18.1 for phonemic awareness, 2.8 to 9.8 for rapid naming of numbers, and 2.5 to 7.9 for the

*Jordan*. On passage comprehension, the amount of contribution for phonemic awareness was more similar to rapid naming of objects. Percentages ranged from 8.2 to 18.1 for phonemic awareness, 4.8 to 13.8 for rapid naming of objects, and 4.2 to 5 for the *Jordan*.

**McBride-Chang and Manis, 1996.** McBride-Chang and Manis (1996) studied a sample of 125 third- and fourth-grade students, 51 "poor" and 74 "good" readers. Poor readers scored at or below the 25th percentile on a word attack test (WRAT), whereas good readers scored at or above the 50th percentile on the same measure. Tests of structural variance were performed on each group separately. In poor readers, phonemic awareness and rapid naming were found to be significant independent contributors of variance to word identification. In contrast, in good readers only phonemic awareness contributed significantly to word identification.

**Relatively Small-Scale Studies**

Seven studies were located that included a relatively small sample size for multivariate analyses, ranging from 37 to 54 subjects; therefore, these results should be interpreted cautiously (Blachman, 1984; Bowers, 1993, 1995; Bowers & Swanson, 1991; Catts, 1991; Cornwall, 1992; Ellis, 1990). Details about the subjects and measures are provided in Tables 1 and 2.

Four of the studies utilized a longitudinal design (Bowers, 1993, 1995; Catts, 1991; Ellis, 1990). Bowers conducted two studies (1993, 1995) with a sample of second graders, who were followed to fourth grade. Hierarchical regressions revealed that phonemic awareness contributed uniquely and significantly to measures of word identification and word attack, but not passage comprehension. Rapid naming only contributed uniquely and significantly to passage comprehension, but not word identification and word attack. In another study with the same sample (Bowers, 1993), hierarchical regressions revealed that when prior word identification, auditory analysis, and rapid naming were entered into the equation in that order, only prior word identification and rapid naming contributed significantly to measures of repeated readings in grades 2, 3, and 4. Correlation coefficients for the first readings were .16, .22, and .15 in grades 2, 3, and 4, respectively ($p < .001$). Coefficients for fourth-grade readings were .20 ($p < .001$), .40 ($p < .001$), and .14 ($p < .01$), respectively. In other words, rapid naming, not phonemic awareness, contributed unique variance to reading speed above and beyond the variance already accounted for by word identification.

In the Catts (1991) study, a multiple-regression analysis revealed that phonemic awareness accounted for the most variance, among various phonological processing variables, in both word recognition and word attack, with correlation coefficients of .36 and .37. Significance levels for these coefficients were not reported. Rapid naming of objects contributed additional significant variance for word identification, but not word attack. The correlation coefficient was not reported, but together phonemic awareness and rapid naming of objects accounted for 50% of the variance in word identification.

Ellis (1990) followed 40 students from age 5 to 7. LISREL (linear structural relations) analyses explored the developmental interactions among reading, short-term memory, and phonological awareness. All analyses were based on a phonological awareness composite score that included syllable segmentation, phoneme segmentation, rhyme recognition, rhyme generation, and sound blending. The only rapid naming task was of colors. Scores at age 5 were compared to scores at age 6, and scores at age 6 were compared to scores at age 7. At both stages, phonological awareness was not found to be significantly correlated with any other measures, except for later ability on phonological awareness. Rapid naming of colors was also only correlated with future rapid naming of colors.

The remaining studies did not employ a longitudinal design, but did examine the variables using multivariate analyses. These studies used other analyses as well, usually addressing related research questions. As stated, only findings related to the relative contributions of phonemic awareness and rapid naming will be reported here.

Blachman (1984) found that rapid naming and phonemic awareness contributed uniquely and significantly to measures of word identification in a sample of kindergarten students and a sample of first-grade students. Bowers and Swanson (1991) found that when phonemic awareness, rapid naming, and vocabulary were analyzed multivariately, phonemic awareness predicted scores in word identification and word attack, but not in comprehension. Phonemic awareness correlation coefficients for the three measures were .10 ($p < .05$), .23 ($p < .001$), and .03 (nonsignificant), respectively. Rapid naming predicted word identification (.12, $p < .05$) and comprehension (.21, $p < .01$), but not word attack (.04, ns). Further, Cornwall (1992) found that different phonological processing variables contributed to the variance in different subskills of reading. Phonemic awareness was significantly and uniquely related to word attack (.35), spelling (.32), and comprehension (.28), but not to fluency or word identification. Finally, rapid naming of letters was significantly and uniquely related to word attack (.18), word identification (.31), and fluency (.30), but not to comprehension or spelling.

**Table 3**

***Unique and Significant Contributions of Phonemic Awareness and Rapid Naming to Reading Subskills***

| Reading Subskill | Studies | Phonemic Awareness | Rapid Naming |
|---|---|---|---|
| Word identification | Ackerman & Dykman, 1993 | significant | significant |
| | Badian, 1993a | significant | significant |
| | Bowers, 1995 | significant | not significant |
| | Bowers & Swanson, 1991 | significant | significant |
| | Catts, 1991 | significant | significant |
| | Cornwall, 1992 | not significant | significant |
| | McBride-Chang & Manis, 1996 | significant | significant |
| | Torgesen et al., 1997 | significant | not significant |
| Word attack | Ackerman & Dykman, 1993 | significant | significant |
| | Badian, 1993a | significant | significant |
| | Bowers, 1995 | significant | not significant |
| | Bowers & Swanson, 1991 | significant | not significant |
| | Catts, 1991 | significant | not significant |
| | Cornwall, 1992 | significant | not significant |
| | Torgesen et al., 1997 | significant | significant |
| Timed word identification | Torgesen et al., 1997 | significant | not significant |
| fluency | Bowers, 1993 | not significant | significant |
| | Cornwall, 1992 | not significant | significant |
| Comprehension | Badian, 1993a | significant | significant |
| | Bowers, 1995 | not significant | significant |
| | Bowers & Swanson, 1991 | not significant | significant |
| | Cornwall, 1992 | significant | not significant |
| | Torgesen et al., 1997 | significant | not significant |

## DISCUSSION

I will now discuss how the studies described above contribute to our understanding of the relationships of phonemic awareness and rapid naming to reading development. The questions underlying the study explored the unique contributions of phonemic awareness and rapid naming to reading development, as well as differential contributions to various reading subskills. Following this discussion, I will draw conclusions and describe implications for future research.

*Does phonemic awareness account for a proportion of the variance in reading development that is not accounted for by rapid naming?* It is clear from the findings of the research studies described above that phonemic awareness accounts for a proportion of the variance in reading development not accounted for by rapid naming. This conclusion is supported in all the studies described, except Ellis (1990). In all studies, multivariate analyses were used that included these two variables so that independent contributions of each variable could be determined. Five of the studies were longitudinal including relatively large sample sizes, ranging from 95 to 216 (Cronin & Carver, 1998; Felton, 1992; Torgesen et al., 1997; Wagner et al., 1994; Wagner et al., 1997). Three, while not longitudinal, analyzed relatively large samples, ranging from 119 to 170 students each (Ackerman et al., 1993; Badian, 1993a; McBride-Chang & Manis, 1996). The remaining smaller studies consistently reported that phonemic awareness was uniquely and significantly related to reading development (Badian, 1993b; Blachman, 1994; Bowers, 1993, 1995; Bowers & Swanson, 1991; Catts, 1991; Cornwall, 1992). Measures in these studies included word identification, word attack, fluency, and comprehension (see Table 1). Phonemic awareness contributed to differences in word recognition in samples from kindergarten through fifth grade (Torgesen et al., 1997).

Only the study by Ellis (1990) did not find unique contributions of phonemic awareness to future reading growth. Two factors may explain these results. First, only 40 students were included in the analysis. Thus, it is possible that there was an insufficient amount of

power to detect subtle correlations, especially considering the multivariate analyses. Second, the phonological awareness measures used may not have been sensitive enough to detect differences in ability. In Ellis' (1990) study, all analyses were conducted based on a composite score that included five measures of phonological awareness. Three of them were relatively simple tasks for kindergarten students: tapping number of syllables, rhyme recognition, and rhyme generation. It is likely that some of the subjects scored at ceiling on these tasks, especially when they were tested for the second and third time at ages 6 and 7.

*Does rapid naming account for a proportion of the variance in reading development not accounted for by phonemic awareness?* The second question addressed by this analysis was not answered as clearly as the first. It appears that rapid naming accounts for a proportion of the variance in reading development in addition to that accounted for by phonemic awareness for students in the early stages of reading development. This would include both normally developing students who are in the early stages of reading development and struggling readers who have been unable to successfully pass through these early stages. Evidence of this conclusion is found in studies of students in kindergarten through second grade as well as in studies of older poor readers.

Wagner and his colleagues (Wagner et al., 1994; Wagner, Torgesen, Rashotte et al., 1997) conducted multivariate analyses on a large sample of students over several developmental time periods. In Wagner et al. (1994), unique contributions from rapid naming were not found when kindergarten scores were compared to first-grade scores or when first-grade scores were compared to second-grade scores. However, when the same sample was analyzed later (Wagner, Torgesen, Rashotte et al., 1997), unique contributions for rapid naming were found from kindergarten to second grade and from first to third grade, but not from second to fourth grade. From these data, therefore, it appears that rapid naming is most important in the early stages of development.

Further support for this conclusion is found in a study by Cronin and Carver (1998) that followed kindergarten and first-grade students for one year. Rapid naming contributed uniquely to a composite score of reading (see Table 2). In another study, Felton (1992) followed students from kindergarten who were average to below average according to their teachers. Kindergarten rapid naming scores contributed uniquely to third-grade reading scores. Blachman (1984) and Catts (1991), who also included students in the early grades in their studies, found that rapid naming contributed uniquely on measures of word identification.

Ellis (1990) was the only study using very young children that did not find unique contributions of rapid naming. However, in this study the only measure of rapid naming was rapid naming of colors, which is not sensitive enough to detect differences in kindergarten students (Wolf, Bally, & Morris, 1986). Torgesen et al. (1997) also did not find unique contributions for rapid naming, but their analysis was conducted on scores from second to fourth grade in a large sample that included a broad range of ability. Bowers (1993, 1995) also analyzed scores of students from second to fourth grade, but the sample included 38 students, half of whom were poor readers. Although the Bower studies should be viewed tentatively due to the small sample size, the larger proportion of poor readers in the sample may have contributed to the different findings. In the Bowers (1995) study, rapid naming was found to contribute uniquely to comprehension, which was not the case in the Torgesen et al. (1997) study. Like Torgesen et al. (1997), Bowers (1995) did not find unique contributions of rapid naming on word identification or word attack during the second- to fourth-grade developmental period. However, unique contributions of RAN were found on fluency.

Evidence of the unique contributions of rapid naming is also found in studies of poor readers who have not successfully completed the early stages of reading development (Ackerman & Dykman, 1993; Badian, 1993a, 1993b; Bowers & Swanson, 1991; Cornwall, 1992; McBride-Chang & Manis, 1996). Only one of these studies employed a longitudinal design. Badian (1993b) followed students who had received "special help" in reading for one year and found that rapid naming uniquely contributed to variance on a composite reading measure one year later. Three relatively large-scale studies (samples ranging from 74 to 170) also showed unique contributions of rapid naming (Ackerman & Dykman, 1993; Badian, 1993a; McBride-Chang & Manis, 1996). Two other studies found similar results. Bowers et al. (1991) demonstrated unique contributions of rapid naming to word identification and comprehension, and Cornwall (1992) found unique contributions on word identification, word attack, and fluency, but not comprehension.

*Do phonemic awareness and rapid naming contribute differentially to various subskills of reading development?* The differential contributions of these variables are even less clear. Eight of the studies described included analyses of at least one subskill of reading development (Ackerman & Dykman, 1993; Badian, 1993a; Bowers, 1993, 1995; Bowers & Swanson, 1991; Catts, 1991; Cornwall, 1992; McBride-Change & Manis, 1996; Torgesen et al., 1997). Table 3 summarizes the findings of these studies for various subskills. As noted, phonemic awareness was found

to consistently contribute uniquely and significantly to individual measures of word reading. These measures included word identification (untimed), timed word identification, word attack, and comprehension (Ackerman & Dykman, 1993; Badian, 1993a; Torgesen et al., 1997). Although the findings for rapid naming were not as consistent (see Table 3), unique contributions were found on some measures of word identification, word attack, comprehension, and fluency.

## CONCLUSIONS AND IMPLICATIONS FOR FUTURE RESEARCH

Researchers have theorized that students with deficits in both phonemic awareness and rapid naming experience the most difficulty learning to read (Blachman, 1994; Bowers & Wolf, 1993; Torgesen et al., 1994). The studies analyzed here provide clear support for continued efforts to evaluate the double-deficit hypothesis by indicating that phonemic awareness and rapid naming each contributes uniquely to variance in reading development. Specifically, phonemic awareness appears to contribute to growth in word reading skills from kindergarten through at least fifth grade (Torgesen et al., 1997), whereas the unique contributions for rapid naming are clear only in the early stages of reading development through approximately second grade. Evidence also suggests that rapid naming may contribute uniquely to differences in word reading ability for older students with reading disabilities. The differential contributions of phonemic awareness and rapid naming to reading tasks other than individual word reading are unclear.

Research studies are needed to further analyze the role of rapid naming in students above the second grade and in poor readers. Studies are also needed that examine reading subskills more carefully, particularly in the areas of timed word identification, comprehension, and fluency. Comparisons on these subskills need to be made between normally developing students and students with reading disabilities.

Continued research on the relationships among phonemic awareness, rapid naming, and reading development is important because of the implications for practice for students with reading disabilities, or dyslexia. Further understanding of the roles of phonemic awareness and rapid naming will lead to earlier, more substantive diagnoses of reading problems and improved theories of reading acquisition. Most important, this information is likely to improve instruction for students with reading disabilities.

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## NOTES

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# COMPARISON OF FASTER AND SLOWER RESPONDERS TO EARLY INTERVENTION IN READING: DIFFERENTIATING FEATURES OF THEIR LANGUAGE PROFILES

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***Abstract.*** **In the longitudinal research reported in this article we examine issues related to the nature and duration of early intervention of relatively low intensity. Specifically, we consider (a) how children who respond faster and slower differ at the end of a 24-lesson intervention spaced over four months in first grade, (b) whether the faster responders maintained their gains during second grade, (c) whether the slower responders could make relative gains with additional intervention, and (d) how the faster and slower responders during the first-grade intervention differed in second grade. In comparing these children who varied in rate of response to early intervention, we focus on differences in their language profiles for potential instructional cues for enhancing the reading of slower responders.**

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A question driving much of the research on at-risk beginning readers is what conditions must be in place for these children to develop adequate reading skills (e.g., Lyon, Alexander, & Yaffe, 1997; Torgesen, 2000). Considerable research has confirmed that explicit instruction in phonological awareness and phonological decoding is an essential component of instruction in early intervention (e.g., Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998; Torgesen, Wagner, & Rashotte, 1997; Torgesen, Wagner, Rashotte, & Herron, 1999; Tunmer & Nesdale, 1985; Vadasy, Jenkins, & Pool, 2000; Vellutino, Scanlon, Sipay, Small, Pratt, Chen, & Denckla, 1996). Less is known about why some at-risk readers respond rapidly to early intervention, while others do not respond or respond very slowly. For example, about 2% to 6% of beginning

readers do not appear to respond to early intervention that emphasizes phonological awareness and phonological decoding in the context of balanced reading instruction (Torgesen, 2000). Also, little is known about the required intensity and duration of early intervention for at-risk beginning readers with well-defined characteristics.

In the longitudinal research reported in this article we examine issues related to the nature and duration of early intervention of relatively low intensity.[1] Specifically, we consider (a) how children who respond faster and slower[2] differ at the end of a 24-lesson intervention spaced over four months in first grade, (b) whether the faster responders maintained their gains during second grade, (c) whether the slower responders could make relative gains with additional intervention, and (d) how the faster and slower responders during the first-grade intervention differed in second grade. In comparing these children who varied in rate of response to early intervention, we focus on differences in their language profiles for potential instructional cues for enhancing the reading of slower responders.

Berninger, Abbott et al. (2000) reported comprehensive details about the first year of this longitudinal study: (a) the first-grade sample drawn from eight schools in four school systems (inclusion criteria, selection procedures, descriptive statistics); (b) the instructional procedures and materials for the first-grade intervention; (c) repeated measures at pretest, midtest, and posttest; and (d) the results as they pertain to application of linguistic principles described in Venezky (1970, 1995, 1999) and of connectionist models in cognitive neuroscience (e.g., Harm & Seidenberg, 1999; Seidenberg & McClelland, 1989) to instructional intervention. Briefly, the intervention, which was delivered 20 minutes a day, twice a week over a four-month interval to dyads as a supplement to the regular reading program, consisted of three segments. In the first 5-minute segment, all children received explicit training in the connections between spelling units[3] and phonemes in alphabetic principle. In the second 10-minute segment, children were randomly assigned to alternative treatments for modeling connections between units of written and spoken words, singly or in combination. In the third 5-minute segment, all children read engaging story books with the tutor providing assistance as necessary using the same kind of prompts as were modeled in the second segment. Discussion was used to create a set that the purpose of reading is to glean meaning and pleasure. For the sample as a whole, whose average Verbal IQ fell at the population mean, mean achievement on the *Woodcock Reading Mastery Test-Revised* (WRMT-R; Woodcock, 1987) increased 10 standard score points for age (2/3 standard deviation) on Word Identification (real word reading) and 14.2 standard score points for age (nearly 1 standard deviation) on Word Attack. The treated groups outperformed an untreated control group in the regular first-grade program on these measures (Stage, Abbott, Jenkins, & Berninger, in press). Student achievement was not statistically related to teacher-reported instructional variables in the regular reading programs, which tended to be balanced (Berninger, Abbott et al., 2000).

Four broad research questions are addressed in the second-year followup study. First, how did the faster and slower responders differ in their reading-related skills before, during, or after the first-grade intervention? Second, did children who reached or exceeded grade level in word reading achievement by the end of the first-grade intervention maintain their gains at the beginning and end of second grade? Third, did the children who were still below grade level in word reading achievement at the end of the first-grade intervention continue to make reliable gains when intervention was sustained over time? If so, were there individual differences that predicted how well they responded to the second year of continued supplementary instruction? Fourth, how did the faster and slower responders differ in their reading profiles at the beginning and end of second grade? The method and results section below is organized by these four research questions.

## METHODS AND RESULTS

### Comparison of Faster and Slower Responders in Reading-Related Skills

By the end of first grade, half of the 128 children were achieving at or above grade level and half were still achieving below grade level. The faster and slower responders were compared at the fourth month of first grade prior to the first-grade intervention, the end of first grade, and from the fourth month to the end of first grade. The Verbal IQ on the *Wechsler Intelligence Scale for Children, Third Edition*, WISC III, (Psychological Corporation, 1991) was given before the first-grade intervention. Other measures given both before and after the first-grade intervention included the following: Word Identification and Word Attack of the Reading Mastery Test-Revised (WRMT-R) (Woodcock, 1987), phoneme deletion (Berninger, Thalberg, DeBruyn, & Smith, 1987), orthographic coding in short-term memory (Berninger, Yates, & Lester, 1991), adaptation of Olson, Kliegl, Davidson, and Foltz's (1985) orthographic choice for first graders, and rapid automatic naming of letters (Wolf, Bally, & Morris, 1986) and rapid automatic switching between letters and numbers (Wolf, 1986).

WISC-III Verbal IQ reliabilities range from .91 to .95, depending on age. WRMT-R Word Identification has an average reliability coefficient of .97, and WRMT-R Word Attack has an average reliability coefficient of .87. The phoneme deletion task used has a reliability of .85. Internal reliability coefficients of orthographic coding tasks range from .74 for letter cluster coding to .75 for letter coding and .84 for word coding. RAN (rapid naming of category-constant stimuli) test-retest over a 9-month interval was .65 for letters; RAS (rapid naming of category-switching stimuli) test-retest over the same interval was .85 for letters and numbers.

The groups differed significantly (but not substantially) in Verbal IQ; they did not differ in chronological age or gender (see Table 1). Prior to the first-grade intervention, the faster responding group ($M$ = 86.3, $SD$ = 9.5) was significantly higher than the slower responding group ($M$ = 80.8, $SD$ = 8.8) on WRMT-R Word Identification, $t(90) = 2.86$, $p < .005$, and the faster responding group ($M$ = 85.8, $SD$ = 11.6) was significantly higher than the slower responding group ($M$ = 75.9, $SD$ = 11.9) on WRMT-R Word Attack, $t(90) = 4.16$, $p < .001$. Thus, both groups were at the low end of the reading continuum, but the slower responders even more so than the faster responders. At the beginning of the first-grade intervention, the difference in reading skills between the two groups was greater for pseudowords than for real words.

At the end of the first-grade intervention, the faster responding group was significantly higher than the slower responding group not only on real word reading and pseudoword reading but also on phoneme deletion, orthographic coding in short-term memory of whole words, letters in a word and letter clusters in a word, word-specific orthographic representations of words in long-term memory (orthographic choice), rapid naming of category-constant stimuli (RAN), and rapid naming of category-switching stimuli (RAS); see Table 1 for means and standard deviations. Thus, they differed on all reading-related skills assessed.

Additional insights were gleaned from growth-curve analyses from the beginning to the middle, to the end of the intervention. These analyses are important because they evaluate individual growth over the course of the intervention. Since the faster responders started out better in word reading, it is not surprising that they ended up better in reading than the slower responders. At issue is whether the faster responders showed more individual growth over the same period of time than did the slower responders. Hierarchical linear modeling (HLM) (Bryk, Raudenbush, & Congdon, 1996) was used to model growth on raw scores for WRMT-R Word Identification and Word Attack for each child in the Year 1 intervention. This technique, which allows researchers to model both growth in instructional interventions for individual children and group growth, has advantages not gleaned by comparing growth curves based simply on fitting linear regression models. For example, HLM employs empirical Bayes estimation and yields a reliability estimate for the slope; also, HLM allows analysis of cross-level relationships in an integrated statistical framework. The empirical Bayes procedure in HLM has an advantage over ordinary least-squares regression in slope estimation (Stage, in press). The individual growth curves enabled us to evaluate whether individuals, regardless of treatment group, showed significant growth (slope derived from HLM modeling was significantly different from chance at $p < .05$). As shown in Table 1, substantially more of the faster responders than the slower responders showed significant individual growth.

Additional analyses focused on the patterns of individual growth for the profile of real-word reading and pseudoword reading for the children in general, regardless of their overall level of rate of response. Growth groups were formed on the basis of significant individual growth curves during the first-grade intervention on (a) both real-word reading and pseudoword reading, (b) real-word reading only, (c) pseudoword reading only, and (d) neither. As shown in the top rows for Year 1 in Table 2, of the 128 children, 41% showed significant growth in real-word and pseudoword reading, 31% showed significant growth in real-word reading only, 3% showed significant growth in pseudoword reading only, and 24% showed no significant growth in either real-word or pseudoword reading during the first-grade intervention. Like students with reading disabilities studied by Lovett, Warren-Chaplin, Ransby, and Bordon (1990) and Lovett et al. (1994), these children tended to have more difficulty with phonological decoding (pseudoword) than word-specific (real word) reading. Size of IQ-achievement discrepancy did not predict slope of growth curves for either real word or pseudoword reading (Stage et al., in press).

Also at issue was which individual difference variables at the beginning and end of the first-grade intervention differentiated these growth groups. Thus, the four growth groups were compared on the individual difference measures[4] in Table 1, both at pretest and posttest, and Verbal IQ at pretest. Main effects in analysis of variance for the four growth groups were found on each of the following learner characteristics: letter cluster at pretest and posttest, orthographic choice at posttest, RAN letter at pretest and posttest, phoneme deletion at pretest and posttest, and Verbal IQ. We then used $t$-tests to analyze which of these learner characteristics differentiated (a) the group that did not grow on either real-word or pseudoword reading from the other

**Table 1**

***Comparison of Groups at the End of 24-Lesson, 4-Month Early Reading Intervention in the Spring of First Grade***

| | Faster Responders[a] | Slower Responders[b] | *t*(87) |
|---|---|---|---|
| **Word Identification**[c] | | | |
| % significant growth[d] | 95.4% | 50.0% | 5.54*** |
| *M* | 102.3 | 86.9 | 7.25*** |
| *SD* | 9.4 | 10.9 | |
| **Word Attack**[c] | | | |
| % significant growth[d] | 77.3% | 20.8% | 6.49*** |
| *M* | 103.0 | 90.7 | 7.60*** |
| *SD* | 8.3 | 7.2 | |
| **Prorated Verbal IQ**[e,k] | | | |
| *M* | 97.2 | 91.4 | 2.47* |
| *SD* | 12.4 | 10.1 | |
| **Orthographic Coding**[f] | | | |
| Letter | | | |
| *M* (%) | 84.4 | 74.8 | 4.75*** |
| *SD* | 10.2 | 9.1 | |
| Letter Cluster | | | |
| *M* (%) | 71.3 | 65.1 | 2.56* |
| *SD* | 12.3 | 8.4 | |
| Whole Word | | | |
| *M* (%) | 89.2 | 79.6 | 5.10*** |
| *SD* | 7.7 | 10.1 | |
| **Orthographic Choice**[g] | | | |
| *M* (%) | 82.7 | 71.7 | 4.47*** |
| *SD* | 9.8 | 13.4 | |
| **Phoneme Deletion**[h] | | | |
| *M* (of 20) | 11.2 | 8.7 | 3.13** |
| *SD* | 3.5 | 4.2 | |
| **RAN/RAS** | | | |
| RAN Letters[i] | | | |
| *M* (sec) | 39.3 | 52.5 | -4.29*** |
| *SD* | 11.3 | 17.3 | |
| RAN Digits[i] | | | |
| *M* (sec) | 38.6 | 46.6 | -3.27** |
| *SD* | 10.4 | 12.5 | |
| RAS Letters and Digits[j] | | | |
| *M* (sec) | 51.2 | 67.0 | -4.16*** |
| *SD* | 13.1 | 21.6 | |
| **Chronological Age** | | | |
| *M* (mos) | 92.5 | 91.9 | 0.60 |
| *SD* | 4.4 | 4.6 | |
| **Gender (% female)** | | | |
| *M* | 0.45 | 0.38 | 0.77 |
| *SD* | 0.50 | 0.49 | |

*$p < .05$.
**$p < .01$.
***$p < .001$.
[a]$n = 44$.
[b]$n = 48$.
[c]WRMT-R (Woodcock, 1987); $M = 100$, $SD = 15$.
[d]% with significant growth curves during first grade intervention.
[e]WISC III (Wechsler, 1991); $M = 100$, $SD = 15$.
[f]Berninger et al. (1991).
[g]Olson et al. (1994).
[h]Modified Rosner (Berninger et al., 1987).
[i]RAN (Wolf et al., 1986).
[j]RAS (Wolf, 1986).

groups, and (b) differentiated the group that grew in both real-word and pseudoword reading from the group that grew in real-word reading only.

The group lacking any growth in reading differed from the other groups on all measures except letter cluster coding at pretest, on which many children scored low. Thus, children showing no growth were at the bottom of the continuum for reading-related processes as well as reading; they had lower Verbal IQs, poorer phonological skills, poorer rapid naming skills, and poorer orthographic skills except for pretreatment letter cluster coding on which all children were initially poor. By the end of the intervention, the zero growth group that grew in neither word reading skill differed from the other groups on letter cluster coding as well.

The group that grew in both real-word and pseudoword reading differed from the group that grew in real-word reading only on letter cluster coding at pretest, $t(91) = -2.56$, $p = .012$, and posttest, $t(90) = -3.06$, $p = .003$, rapid naming of letters at posttest, $t(88) - 2.35$, $p = .021$, and prorated Verbal IQ, $t(89) = 3.35$, $p = .001$; differences in degrees of freedom are due to missing data. Thus, the ability to code single letters and letter clusters, which is needed to apply the alphabet principle, was not as well developed in children who did not show significant growth in phonological decoding of pseudowords at the same time they showed significant growth in real-word reading. However, general verbal ability also contributed to a lack of significant growth in decoding at the same time children grew in real-word reading.

The findings for letter cluster coding and rapid naming of single letters in this comparison suggest that if these orthographic skills are underdeveloped, they may compromise early reading development for at-risk beginning readers in general, not just the slower responders, especially in application of alphabetic principle to unfamiliar words. Theories of orthographic processing should distinguish among (a) coding written words and their constituents into short-term memory where phonemes are mapped onto spelling units in words just read; (b) word-specific representations in long-term memory that are activated when familiar words are read; and (c) metaknowledge (e.g., judgments of legal spellings, positional information, and word-like properties). The first appears to compromise acquisition of

**Table 2**

***Mean Age-Corrected Standard Scores at Posttest for Growth Groups Defined on the Basis of Significant Individual Growth Curves in Wave 1 Intervention in First Grade (N = 128) and Wave 2 Intervention in Second Grade (N = 48)***

| | Both Word Identification and Word Attack[b] | Word Identification Only | Word Attack Only | Neither |
|---|---|---|---|---|
| Year 1 | *n* = 53 | *n* = 40 | *n* = 4 | *n* = 31 |
| WI[a] | | | | |
| *M* | 101.8 | 94.5 | 87.8 | 80.1 |
| *SD* | 10.1 | 8.8 | 8.4 | 10.2 |
| WA[b] | | | | |
| *M* | 104.2 | 90.9 | 97.3 | 86.8 |
| *SD* | 6.6 | 10.1 | 3.9 | 7.9 |
| Year 2 | *n* = 14 | *n* = 19 | *n* = 6 | *n* = 9 |
| WI[a] | | | | |
| *M* | 94.1 | 89.3 | 92.5 | 86.3 |
| *SD* | 11.2 | 12.7 | 12.6 | 12.8 |
| WA[b] | | | | |
| *M* | 98.8 | 90.9 | 102.5 | 91.6 |
| *SD* | 9.8 | 9.5 | 11.1 | 8.7 |

[a]Real-word reading.
[b]Pseudoword reading.

alphabetic principle in at-risk beginning readers (results comparing growth groups; also Berninger et al., 1991). The second skill may compromise development of real-word reading skills (Stage et al., in press), but the third skill does not appear to differentiate good and poor readers (Siegel, Geva, & Share, 1995).

It was surprising, based on both empirical studies (e.g., Wagner & Torgesen, 1987) and computational simulations (e.g., Harm & Seidenberg, 1999), that phonological deletion did not differentiate the group that grew in real-word reading and pseudoword reading and the group that grew in real-word reading only. We suspect that our alphabetic principle training, by virtue of the decontextualization of the target phoneme and training in spelling-phoneme correspondences that enable phoneme awareness (Perfetti, 1985), facilitated development of phoneme skills in both growth groups. Because both phoneme manipulation and letter and letter cluster coding in short-term memory are skills needed to apply the alphabetic principle, future studies might include an instructional component for improving letter cluster coding in memory. The point is that both phoneme and orthographic (letter coding) skills contribute to phonological decoding of unknown words, as assessed by pseudoword reading, which is not purely a phonological task.

### Second-Grade Monitoring of Faster Responders

Not all 128 children were available for the Year 2 followup study due to the mobility of the families in schools in our area-either to schools outside a reasonable driving range or to other schools than the eight with which we had permission to work. The Year 2 study was confined to those schools that had participated in Year 1. Attrition rate was not systematically related to the treatment children had experienced during first grade. Of the 64 faster responders at or above grade level at the end of first grade, 44 (20 girls, 24 boys) still attended one of the eight participating schools and their parents granted informed consent for them to be monitored in fall and spring of second grade. Of the 44 in this Monitor Only Group at the beginning of second grade, 41 still attended the same school and completed the study at the end of second grade.

Three measures were given to both the Monitor Only Group (faster first-grade responders) and the Continue Tutor Group (slower first-grade responders) in October of second grade and again in May of second grade. The WRMT-R Word Identification and Word Attack subtests were administered individually. These tests require children to read lists of real words or pseudowords, respectively. The *Gates MacGinitie Reading Comprehension Test* (GM Comp) (MacGinitie & MacGinitie, 1989), which had not been given in Year 1, was group-administered. This test requires children to read passages silently and answer multiple-choice questions.

Table 3 (first column) reports the second-grade fall and spring mean test scores and *t*-test results for the Monitor Only Group on two measures of word reading and one measure of reading comprehension. The second-grade fall scores were not significantly different from the first-grade spring scores. At each time point in second grade, the average score fell above the mean. Although the second mean test score was always higher than the first, the differences in means were not statistically significant. However, the relative gains made in first grade were maintained the following school year for the Monitor Only Group. The early boost seemed sufficient to give these faster responding at-risk readers, who began their journey to literacy at the low end of the reading continuum, a sufficient jumpstart to function consistently in the average range over a yearlong interval. Both at the beginning and the end of second grade, the Monitor Only Group was higher than the Continue Tutor Group on real-word reading, pseudoword reading, and reading comprehension (see last column in Table 3), indicating that the faster first grade responders retained their relative superiority over the slower responding first graders.

### Continuing Tutoring during Second Grade of the Slower First-Grade Responders

Of the 64 still below grade level, the first 48 (18 girls, 30 boys) whose parents granted informed consent were offered continuing tutoring during second grade. This Continue Tutor Group was also assessed in fall and spring of second grade. The Monitor Only Group[5] did not differ from the Continue Tutor Group[6] in distribution of ethnic groups, $c^2(5) = 2.25$, $p = .81$. Likewise, the groups did not differ in distribution of mother's level of education, $c^2(5) = 6.39$, $p = .27$.

The 48 children were randomly assigned to one cell of a four-condition design: alphabetic principle + question asking; alphabetic principle + summarization; combined alphabetic principle and syllable awareness + question asking; and combined alphabetic principle and syllable awareness + summarization. Application of alphabetic principle in English depends to some degree on knowledge of syllable structure; for example, whether the letter "a" should be decoded as a short or long vowel depends on whether it occurs in a closed or open syllable, respectively. Thus, we evaluated whether combining syllable awareness and alphabetic principle training was more beneficial than alphabetic principle training alone. In contrast to the Year 1 intervention that trained monosyllabic words, Year 2 intervention trained only polysyllabic words. Question answering and summarization are two techniques for developing reading comprehension

in reciprocal teaching (e.g., Palincsar & Brown, 1984). We compared these two techniques in the context of teacher-led rather than student-led activities in implementation of reciprocal teaching in a classroom setting. In contrast to the Year 1 intervention that was delivered to dyads, Year 2 intervention was delivered to individuals so the potential for peer interaction was removed. The questions were all *who*, *what*, and *where* questions that focused on accurate recall of text-based information rather than inferential questions that would draw on students' background of knowledge, which could mask what they really comprehended in text.

The four tutors were balanced across the four treatment conditions; each tutored three children in each condition. As in Year 1, intervention commenced in January of the school year and concluded by the end of April; again, children were given twenty-four 20-minute individual tutorial sessions which, on average, occurred twice a week except for school closures.

During the first 3 minutes, children used student cards in which each spelling unit was paired with a picture of a word containing the target phoneme associated with it to review the alphabetic principle to which they were introduced in Year 1. Thirteen correspondences not covered in Year 1 were added, mostly related to polysyllabic words; for example, spellings for the schwa or reduced vowel in unaccented syllables. The 109 correspondences were divided into three roughly equal groups, which were alternated across the 24 lessons so that each third was practiced every three lessons for a total of eight times. During the first 12 lessons, the tutor modeled the associations between spelling unit picture and phoneme, as in Year 1. The tutor named the letter or letters in the spelling unit, said the name of the pictured word with the target

**Table 3**

***Second-Grade Followup in Fall and Spring for Students in First-Grade Intervention***

| | Monitor Only[a] | Continue Tutor[b] | Monitor vs. Continue |
|---|---|---|---|
| **Word Identification[c]** | | | |
| Fall | | | $t(87) = 5.06^{***}$ |
| *M* | 105.2 | 85.3 | |
| *SD* | 12.2 | 11.6 | |
| Spring | | | $t(87) = 6.92^{***}$ |
| *M* | 107.4 | 90.6 | |
| *SD* | 10.5 | 12.2 | |
| Fall vs. Spring $t(40)$ | 2.27 | $3.91^{***}$ | |
| **Word Attack[c]** | | | |
| Fall | | | $t(87) = 7.79^{***}$ |
| *M* | 103.5 | 88.2 | |
| SD | 9.4 | 9.2 | |
| Spring | | | $t(87) = 4.01^{***}$ |
| *M* | 105.5 | 94.8 | |
| *SD* | 14.8 | 10.4 | |
| Fall vs. Spring $t(40)$ | 1.11 | $6.16^{***}$ | |
| **Reading Comprehension[d]** | | | |
| Fall | | | |
| *M* | 54.9 | 33.4 | $6.04^{***}$ |
| *SD* | 13.7 | 18.9 | |
| Spring | | | |
| *M* | 56.6 | 37.8 | $5.06^{***}$ |
| *SD* | 13.7 | 20.2 | |
| Fall vs Spring $t(40)$ | 1.03 | 1.61 | |

$^{***}$ $p < .001$.
[a] $n = 44$ beginning 2nd, 41 end 2nd; faster responders in first grade.
[b] $n$ 48; slower responders in first grade.
[c] WRMT-R (Woodcock, 1987), $M = 100$, $SD = 15$.
[d] GM Comp (MacGinitie & MacGinitie, 1989), $M = 50$, $SD = 20.11$.

phoneme, and made the phoneme in isolation. The child then repeated the auditory sequence — naming the letter(s) in the spelling unit, naming the word, and producing the target phoneme while looking and pointing at the visual stimuli on their student cards. During the last 12 lessons the tutor pointed to the spelling unit, and the child alone produced the sequence of naming the spelling unit and producing the associated phoneme, unless assistance was required and was provided; the intermediate step of naming a word with the target phoneme was omitted during the last 12 lessons.

For the next 10 minutes, instruction focused on specific words. For each lesson, 14 polysyllabic words were selected from the text to be read later in the session. Four sessions were required to complete each of the six texts,[7] so each list was practiced four times. Of these, at least two exemplar words contained a syllable representing each of the seven syllable types in English: closed, open, silent e, vowel team, r-controlled, -le, and schwa (see the Appendix for sample word list). In each word the one- and two- letter spelling units taught and reviewed in the first segment were color coded to draw students' attention to the spelling units that correspond to phonemes. Time was equated across the treatment conditions by including a filler activity (listening to a story) in the alphabetic principle training only condition during the portion of time the other group spent on syllable awareness training.

Children who received only alphabetic principle training practiced the words in the second segment in the following way. First, the tutor named the word and spelled it, spelling unit by spelling unit. The child repeated the name of the word and the sequence of spelling units. Then, in left-to-right sequence, the tutor pointed to each color-coded spelling unit (one or two letters) and modeled its corresponding phoneme. Finally, the child pointed to each spelling unit and produced the associated phoneme. Following this procedure with all 14 words, the child was shown a list with all 14 words and was asked to name them. This approach integrates lexical feedback as in connectionism (e.g., Seidenberg & McClelland, 1989) and sublexical feedback (Thompson, 1996) following alphabetic principle training. For the remaining time in the second segment, the tutor read part of a continuing story to the child.

Children who received both syllable awareness training and alphabetic principle training always received the following training geared to syllables before practicing the words in the way just described for the alphabetic principle training only. First, the tutor said the word. Next, the tutor asked the child to say the word syllable by syllable. Then, the tutor said the word syllable by syllable and asked the child to place one colored disc on a "desktop" card for each phoneme in each syllable. Because syllable boundaries in English may vary with the speed with which a word is pronounced, the phoneme segmentation step was adapted to how the child had segmented the word into syllables. (For example, depending on how fast a word is said, rabbit may be segmented orally as rab/bit or rabb/it.) Then, the tutor showed the child a card with the written form of each of the words, with slashes that segmented the word into syllables. Children were asked to classify each syllable into its type using speaking syllables cards, with a visual schematic of a closed, open, silent e, vowel team, r-controlled, -le, or schwa syllable using the symbols C for consonant, V for vowel, diacritical marks for short and long vowels, and x over silent letters (reproduced in Berninger, 1998). Children were told that sometimes the visual segmentation of the word into syllables may seem different from the syllables they perceived in the spoken form of the word, which may differ depending on rate of speech. However, when relevant, tutors pointed out how the orthography represents the spoken form; for example, the "b" in rabbit is doubled to mark the first syllable as closed and not open. Children were not taught canned rules for segmenting visual words into syllables; they were always encouraged to think about segmentation both in the spoken and the visual forms of the word.

For the last 7 minutes, children read engaging texts orally. If they could not pronounce a word, the tutor encouraged them to use the student cards for alphabetic principle and/or for speaking syllables to decode unknown words, depending on what was taught in their treatment condition. Altogether, children read six texts[7] divided into four sections over the course of the 24-tutorials. When the selection for the day was completed, the tutor posed a set of scripted questions or asked the child to summarize the selection in his or her own words.[8]

A four-pronged approach was used to ensure that the intervention was delivered in a standard, consistent manner. First, tutors used timers to ensure compliance with time limits. Second, weekly meetings were held with tutors to address any instructional or management problems that arose and deal with them in a consistent manner. Third, tutors were required to read and periodically review the instructional manual with all procedures and to complete a self-monitoring checklist at the end of each day. Fourth, tutors audiotaped at least 10 sessions across the various treatments. Assessment of audiotapes of each treatment resulted in overall mean ratings of 9.9 ($SD$ = 0.32), where 10 is perfect.

Separate two-way ANOVAs (two levels of word training — alphabetic principle only or combined alphabetic

principle and syllable awareness; and two levels of comprehension training — question asking or summarization) performed on each of the three measures in Table 3 generated the following results for the Continue Tutor Group. Time effects were statistically significant only for the measures of word reading. Continued tutoring resulted in improved real-word reading, $F(2, 84) = 5.63$, $p < .005$, and pseudoword reading, $F(2, 84) = 23.33$, $p < .0001$, but there were no treatment-specific main effects. Adding syllable awareness training to alphabet principle training did not appear to have an advantage over alphabetic principle training alone for these slower responding at-risk beginning readers. No main effects or interactions were found for the two kinds of comprehension training, showing that it is easier to increase word reading skills in the slower responders than it is to increase their reading comprehension. However, taking into account specific combinations of word reading training and reading comprehension training, the contrast between the treatment that paired alphabetic principle training and summarization (mean gain of 13.5 normal curve equivalent points) and that paired the combined syllable awareness and alphabetic principle training with question answering (mean loss of 1.7 normal curve equivalent points) was statistically significant, $F(1, 44) = 4.04$, $p = .05$. Additional research is needed to evaluate whether this finding, which suggests that pairing alphabetic principle training with summarization is especially effective with the slower responding at-risk readers, replicates on other samples of slower responders.

Additional analyses examined individual differences among the slower responders in their response to continued tutoring. Before, midway through, and immediately after the continued tutoring, each of the 48 children had completed a pseudoword reading task that contained 89 of the spelling-phoneme correspondences taught. This task was scored in terms of whether specific spelling-phoneme correspondences within the word were correctly decoded rather than on the basis of whether the whole word was decoded correctly. For example, in a pseudoword probe like vor, the "v" would be scored as a one-letter unit and the "or" (r-controlled vowel) would be scored as a two-letter unit. The one-letter and two-letter spelling units were analyzed separately. As means and F-tests reported in Table 4 show, over the course of the tutorial, children improved significantly in phonologically decoding both the one- and two- letter spelling units. However, as shown in Table 5, after treatment only the two-letter spelling units on our transfer measure of pseudoword reading contributed unique variance to reading pseudowords and real words on a standardized test; but before treatment only one-letter units on our test contributed unique variance to reading pseudowords on a standardized test and only two-letter units on our measure contributed unique variance to reading real words on a standardized test.

Considering that ability to learn phonemes associated with two-letter spelling units may be critical to continued word reading growth of the slower responders, we then examined which individual difference measures, which were available only at the end of first grade, might predict these children's initial abilities in decoding two-letter spelling units at the beginning of second grade prior to ongoing intervention. Table 6 summarizes the findings. Phoneme deletion contributed unique variance to both one- and two- letter spelling units. Rapid naming of letters contributed unique variance to knowledge of phoneme-single letter correspondences and marginally significant unique variance to phoneme-two letter correspondences. Letter cluster coding contributed marginally significant unique variance to phoneme correspondences with spelling units of either one- or two- letter size. One interpretation of these data is that phoneme skills are very important in learning to decode words but later in reading acquisition orthographic coding of two-letter spelling units becomes important in applying alphabetic principle.

HLM growth curves (Bryk et al., 1996) were computed for individuals who received the Year 2 continued tutoring and evaluated for significance above chance. Growth groups were then formed, according to whether significant growth occurred in (a) both real-word and pseudoword reading, (b) real-word reading only, (c) pseudoword reading only, or (d) neither; results are reported in Table 7. As in Year 1, children were more likely to show significant growth in real word than in pseudoword reading (all but 15 of the 48 subjects). Children who grew significantly in both real-word and pseudoword reading had the highest overall achievement in real-word reading. The six children who grew only in pseudoword reading had higher overall achievement in real-word and pseudoword reading than those who grew only in real-word reading. This finding suggests that children who do not begin to develop phonological decoding skills by the end of second grade, even though they develop word-specific reading skills, may be at continued risk in further development of their word recognition skills.

Consistency of growth groups from first to second grade was also examined. Although there was some consistency across grades (see diagonals in Table 7), there was also flexibility in growth across the years (see off-diagonals in Table 7), suggesting that these growth groups reflect normal fluctuations in developmental processes and not fixed subtypes. Manis, Seidenberg, Doi, McBride-Chang, and Petersen (1996) reported

**Table 4**

***Descriptive Statistics for Phonologically Decoding Taught Single-Letter and Two-Letter Spelling Units in Pseudoword Transfer Words Over the Course of the Second-Grade Tutorial for the Continue Tutor Group***

| | Beginning[a] | | Middle[b] | | End[c] | | *F*(2, 44) | *p* |
|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | | |
| **1-letter**[d] | 22.2 | 3.8 | 24.9 | 4.8 | 27.5 | 4.3 | 47.25 | .0001 |
| **2-letter**[e] | 25.7 | 10.6 | 29.2 | 11.3 | 33.9 | 9.9 | 32.07 | .0001 |

[a]Prior to first tutorial session.
[b]After 12 tutorial sessions.
[c]After 24 tutorial sessions.
[d]33 possible in transfer words.
[e]56 possible in transfer words.

**Table 5**

***Unique Contribution of Single- and Two-Letter Spelling Units[a] to Word Reading for the Continue Tutor Group***

| | r | $R^2$ | F[b] | *p* | beta | t | *p* |
|---|---|---|---|---|---|---|---|
| Before Treatment | | | | | | | |
| Word Identification[c] | | .64 | 38.82 | .001 | | | |
| 1-letter unit | .38 | | | | .1900 | 1.15 | .2593 |
| 2-letter unit | .35 | | | | .6366 | 3.84 | .0004 |
| Word Attack[c] | | .44 | 17.04 | .001 | | | |
| 1-letter unit | .65 | | | | .4530 | 2.19 | .034 |
| 2-letter unit | .61 | | | | .2380 | 1.15 | .257 |
| After Treatment | | | | | | | |
| Word Identification[c] | | .49 | 21.74 | .001 | | | |
| 1-letter unit | .61 | | | | .2297 | 1.43 | .1596 |
| 2-letter unit | .68 | | | | .5121 | 3.19 | .0026 |
| Word Attack[c] | | .65 | 16.30 | .001 | | | |
| 1-letter unit | .58 | | | | .2746 | 1.60 | .1164 |
| 2-letter unit | .62 | | | | .4162 | 2.43 | .0193 |

[a]Taught spelling units that were on transfer test of pseudoword reading. [b]df = 2, 43 before treatment; 2, 45 after treatment because of missing data before treatment. [c]WRMT-R (Woodcock, 1987).

comparable findings for developmental fluctuations in lexical and sublexical reading processes. The distributions of first-grade and second-grade growth groups for the continuing tutoring group did not belong to the same underlying distribution, as evidenced by the nonsignificant $c^2(9)$ of 3.65, $p = .93$. That is, for the slower responding children, type of growth in first grade did not determine how they grew in second grade. Five of the nine children who grew in neither measure in second grade had grown in either both or in real-word reading in first grade. Conversely, seven of the children who grew in neither in first grade grew in both in second

**Table 6**

***Predicting Single- and Two-Letter Decoding in Transfer Pseudowords at the Beginning of Second Grade From Individual Differences in Phonological, Rapid Automatic Naming (RAN), and Orthographic Skills at the End of First Grade***

| | r | $R^2$ | F(4, 42) | *p* | beta | t | *p* |
|---|---|---|---|---|---|---|---|
| **Decoding Single-Letter Units** | | .39 | 6.71 | .0003 | | | |
| Phoneme Deletion | .45*** | | | | .356215 | 2.880 | .0063 |
| RAN Letters | -.40** | | | | -.307044 | -2.313 | .0063 |
| Letter Coding | .31* | | | | .000324 | 0.002 | .9983 |
| Letter Cluster Coding | .39** | | | | .273353 | 1.982 | .0541 |
| **Decoding Two-Letter Units** | | .64 | 7.42 | .0001 | | | |
| Phoneme Deletion | .48*** | | | | .382007 | 3.15 | .0030 |
| RAN Letters | -.37** | | | | -.245439 | -1.89 | .0661 |
| Letter Coding | .37** | | | | .094854 | 0.655 | .5161 |
| Letter Cluster Coding | .41** | | | | .252224 | 1.866 | .0690 |

* $p < .05$.
** $p < .01$.
*** $p < .001$.

grade. Eight who grew in neither in first grade grew in real-word reading in second grade. Three who grew in neither in first grade grew in pseudoword reading in second grade. Of 48 children, only four grew on neither measure in first grade or second grade. Thus, developmental flux and discontinuities are likely to be found in slower responding at-risk readers, who should be carefully monitored for growth in real-word and pseudoword reading, during both first and second grade.

Reasons for the lack of growth of four children in two consecutive years were explored. One child with an above-average IQ and no family history of reading problems had experienced psychological trauma in the home. One child who met the WISC III vocabulary cutoff of a scaled score of 6 ended up having a prorated Verbal IQ in the mildly retarded range, which was consistent with parent and teacher observations of her general lack of responsiveness to any kind of instruction. A child from a family riddled with dyslexia had a history of language delay in the preschool years, attention deficit disorder for which he took ritalin, and had received every kind of service available in the school (speech and language, Chapter 1, and counseling) except special education for which he did not qualify because the discrepancy between his Verbal IQ and reading achievement was not large enough. The fourth child was from a family with a strong history of reading problems but the school was not aware of her extreme difficulty and had told the parent she would outgrow the problems with maturation. As one of six of the slower responders with better comprehension than word reading, her strong comprehension skills were masking her inordinate difficulty in learning word recognition skills, as happens in some cases of dyslexia (see Berninger, 2001).

### Comparison of Second-Grade Reading Profiles of Faster and Slower Responders

Also of instructional significance is the relationship between word reading and reading comprehension in the two groups both at the beginning and the end of second grade. To compare the relationship between these two reading skills, we first rescaled the comprehension measure to the same scale as the word recognition measures with a mean of 100 and a standard deviation of 15. For this purpose we used scaled scores for grade on WRMT-R Word Identification and Word Attack because the GM Comp normal curve equivalents (nce's) are based on grade norms. Then we coded the profiles that were consistent at the beginning and end of the school year — that is, the same skill was always relatively higher (either Word Identification or Reading Comprehension) and the same skill was always relatively lower. Such profiles of uneven development of word and text level skills were also found in normally developing second, fourth, and sixth graders (Berninger, 1994) and in third and fifth graders (Berninger, Abbott,

& Alsdorf, 1997). As shown in Table 8, about 75% of these profiles in the total sample were consistently uneven across second grade for these at-risk beginning readers. However, the groups showed a contrasting pattern in the relationship between word reading and reading comprehension skills. The Monitor Only Group tended to be relatively better at comprehension than word reading, and the Continue Tutoring Group tended to be relatively better at word reading than comprehension. As shown in Table 8, 46% of the Monitor Only Group, compared to 13% of the Continue Tutor Group, had substantially higher reading comprehension than word reading skills, and 60% of the Continue Tutor Group, compared to 29% of the Monitor Only Group, had substantially higher word reading skills. This pattern of association between fast- and slow-responding groups during early intervention and the relationship between word reading and reading comprehension achievement was statistically significant, $c^2$ (1), with continuity correction = 11.80, $p < .001$.

For GM Comp, a two-way ANOVA for group (two levels) and size of the difference between word reading and comprehension (see *M*s and *SD*s in Table 8) revealed no main effect for group, but there was a main effect for the language profile (whether word reading or reading comprehension was relatively more developed), $F(1, 62) = 104.9$, $p < .001$. The size of the difference was slightly greater when reading comprehension was better developed. However, this main effect was qualified by an interaction between group and language profile, $F(1, 62) = 8.96$, $p < .004$. As the mean differences between word reading and reading comprehension in Table 8 show, the slower responders who had better reading comprehension demonstrated even larger differences between their reading comprehension and word reading skills than the slower responders who had better word reading. In contrast, the size of the difference was about the same for the faster responders whether or not their reading comprehension or word reading was better developed. Figure 1 plots results as a function of the word reading-reading comprehension skill difference and illustrates that the groups do not differ when word reading is better developed (white bars above the x-axis are approximately the same height for each group), but do when reading comprehension is better developed (the shaded bars below the x-axis are different for the groups). The difference is relatively greater for individuals in the Continue Tutor Group (whose word reading skills are less well developed than their reading comprehension skills) than in the Monitor Only Group.

Taken together, these results indicate that aiming instruction solely at word reading skills in the slower responding at-risk beginning readers may not be sufficient. Many (not all) need explicit, intensive, sustained comprehension instruction in addition to explicit instruction in word reading. At the same time, helping many (not all) faster responders develop better word reading skills may remove a bottleneck in the reading system, allowing their reading comprehension skills to develop normally.

The results also suggest that four subtypes, defined on the basis of component reading skills, may emerge in response to early intervention in a sample of at-risk beginning readers, selected because they are at the lower end of the continuum of word reading skills in mid first grade. The *first subtype*, which is the most prevalent in the faster responders, has relatively less well developed word reading than reading comprehension skills; their relative strength in reading comprehension may be due

**Table 7**

***Consistency of Growth Groups From Wave 1 in First Grade to Wave 2 in Second Grade***

| | Year 2 | | | |
|---|---|---|---|---|
| | **Both** | **WI Only** | **WA Only** | **Neither** |
| **Year 1** | | | | |
| Both | 3 | 3 | 0 | 2 |
| WI only | 3 | 7 | 3 | 3 |
| WA only | 1 | 1 | 0 | 0 |
| Neither | 7 | 8 | 3 | 4 |

*Note.* WI = Word Identification; WA = Word Attack.

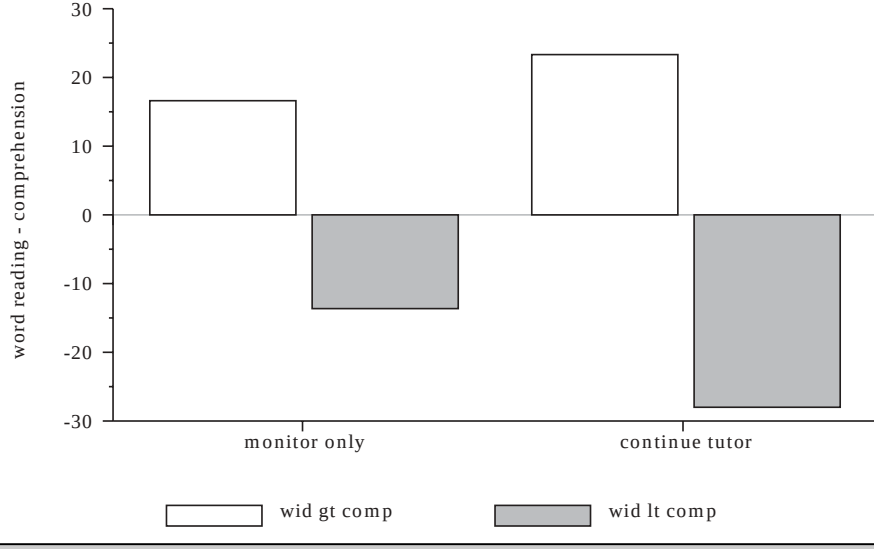
**Table 8**

***Relationships Between Word Identification (WI) and Comprehension (Comp) in Second Graders Who Received Early Intervention in Reading During First Grade[a]***

| | n | % Consistent | Mean Difference Beginning 2nd *M* | Mean Difference Beginning 2nd *SD* | Mean Difference End 2nd *M* | Mean Difference End 2nd *SD* |
|---|---|---|---|---|---|---|
| **Monitor Only Group[b]** (*n* = 41) | | | | | | |
| Consistent[d] WI > Comp | 12 | 29 | 14.2 | 10.4 | 16.7 | 10.3 |
| Consistent[d] Comp > WI | 19 | 46 | 11.5 | 5.6 | 14.0 | 7.9 |
| **Continue Tutoring Group[c]** (*n* = 48) | | | | | | |
| Consistent[d] WI > Comp | 29 | 60 | 19.6 | 15.6 | 23.3 | 15.0 |
| Consistent[d] Comp > WI | 6 | 13 | 27.3 | 12.0 | 28.7 | 8.1 |

[a]WI = WRMT-R Word Identification standard score for grade (*M* = 100, *SD* = 15); Comp = GM Reading Comprehension (normal curve equivalents rescaled to *M* = 100, *SD* = 15).
[b]Intervention only in first grade.
[c]Intervention in first and second grade.
[d]Same relative pattern at beginning and end of second grade.

***Figure 1.*** Comparison of monitor only and continue tutor groups as a function of word reading-reading comprehension difference. Open boxes indicate word reading greater than reading comprehension. Shaded boxes indicate word reading less than reading comprehension.



to their relatively well developed verbal reasoning skills. With an early boost in developing word reading skills, their reading takes off and falls, on average, in the average range and in some cases even above the mean. The bottleneck in their word reading is not severe and is responsive to early intervention. However, a smaller percentage of these faster responders may develop relatively better word reading skills, the focus of the intervention, than reading comprehension skills and thus represent a *second subtype*. The less frequent second subtype among the faster responders, whose word reading skills are relatively better developed, should be monitored during third and fourth grade to make certain they do not develop specific problems in comprehension, such as those studied by Oakhill (e.g., Oakhill & Yuill, 1996), Scarborough (e.g., Leach & Scarborough, 1999; Scarborough & Leach, 2000), or Swanson (e.g., Swanson & Alexander, 1997), for which they will need specially tailored comprehension instruction. Both of these emergent subtypes probably reflect normal variation in relative development of two reading skills, both of which fall in the acceptable range of reading skills for grade.

Among the slower responders there are also two subtypes. Slower responders whose word reading skills are relatively better developed than their reading comprehension skills represent a *third subtype* that may need the most sustained intervention of any of the at-risk beginning readers. They have significant instructional needs in both word reading and reading comprehension. The smaller group within the slower responders is a *fourth subtype* who should be closely monitored for dyslexia, a reading disorder in which word reading is underdeveloped compared to text-level reading comprehension and verbal comprehension skills (Berninger, 2001). Their relatively strong comprehension skills may mask the difficulties they are having with word reading early in the reading acquisition process. Often their reading disability does not become apparent until the intermediate grades when they are no longer able to keep up with reading assignments, and instruction geared to their word reading problems is no longer a standard part of the reading curriculum. Even if they make strong gains in reading comprehension during early intervention, their progress in word reading should be carefully monitored until it reaches at least an average level for grade and remains consistently at that level for at least two years.

## GENERAL DISCUSSION

Early intervention in addition to the regular program can be expensive. Schools need to consider cost effectiveness. It is cost effective to provide early intervention only as long as it is needed. Failure to provide sufficient early intervention when the probability of prevention is the highest is not cost effective in the long run. The results of this longitudinal study suggest that some beginning at-risk readers only need intervention of brief duration whereas others need more sustained intervention.

The faster responding at-risk readers maintained their relative gains throughout second grade. These faster responding children differed from the slower responding children on the level of their initial reading skill and Verbal IQ. That is, the faster responders tended to be at about a standard deviation below the mean, whereas the slower responders tended to be about 1 1/3 to 1 2/3 standard deviations below the mean in their initial word reading skills. Further research is needed to evaluate whether -1 standard deviation in word reading is a valid, cost-effective cutoff for predicting who will need early intervention of shorter as opposed to longer duration. The faster responders also tended to differ from the slower responders on all the reading-related language skills shown to be the best predictors of response to early intervention, namely, phonological, orthographic, rapid naming, and verbal reasoning skills (also see, Stage et al., in press). That is, the slower responders tended to have a language system in which all the component skills were less well developed than was the case for the faster responders. Both groups had language skills within the normal range; none of the children had primary language disability. Thus, the slower responders may be children whose language skills (not necessarily other cognitive skills) fall in the low end of the normal distribution of language skills and will therefore require more intense, explicit language-based instruction over a longer period of time to acquire adequate levels of reading skill. In addition, the faster responders and the slower responders tended to differ in the relative patterning of their component reading skills. The faster responders tended to have relatively better developed reading comprehension, whereas the slower responders tended to have relatively better developed word reading skills. Early intervention that focuses solely on word reading may not be sufficient for most slower responders.

However, there were exceptions within both the faster and the slower responding groups. Nearly a third of the faster responders demonstrated a persisting pattern in which their word reading skills were relatively better developed than their reading comprehension. These children should be monitored during the third-to-fourth-grade transition to make sure that they do not exhibit specific comprehension disabilities as curriculum demands increase in the area of comprehension (cf. Oakhill & Yuill, 1996; Scarborough & Leach, 2000; Swanson & Alexander, 1997). Some of the slower responders had relative strengths in reading

comprehension that might mask their continuing difficulties in word reading during the primary grades. These students might need continuing special assistance in learning word reading skills throughout elementary schooling even though the curriculum often does not provide such instruction in the intermediate grades. The point to emphasize is that early intervention may not be sufficient to eliminate all kinds of specific reading disabilities, and further research is needed on progress monitoring for specific at-risk profiles throughout elementary school.

The slower responding at-risk beginning readers continued to make reliable gains during the second year of continued tutoring. This finding demonstrates that with intervention of sufficient duration, at-risk readers will continue to make progress. However, it also raises an issue related to decision rules, which are needed not only for identifying who needs early intervention but also for terminating early intervention. On what basis can educators determine that a child has reached a reasonable level of achievement and that the regular program of reading instruction will be sufficient? Like other domains of human ability, reading is characterized by normal variation along a continuum of ability. Just as not everyone is expected to be a world-class athlete, musician, or chess player, likewise it is unreasonable, despite the Lake Wobegon longing for everyone to be above-average that is fueling the current educational reform movement, to expect everyone to be an above-average reader, a statistical impossibility. As shown in Table 3, the Continue Tutor Group attained word reading scores in the average range (but below the mean) by the end of the second year of intervention, and their average level of achievement was commensurate with what would be expected on the basis of their verbal ability (in the average range but below the mean) (see Table 1). These results suggest that they are ready, as a group, to graduate from early intervention. At the same time, those with the pattern of relatively better word reading skills would probably benefit from continued explicit instruction in comprehension in the regular reading program and those with the pattern of relatively better reading comprehension would probably benefit from continued explicit instruction in word reading in the regular reading program. In both cases this explicit instruction should be delivered in the context of a balanced reading program so that all reading skills continue to develop.

Level of reading achievement may not be the only yardstick to consider when evaluating whether reading achievement continues to be acceptable. Growth curves that evaluate whether change in a skill is reliable over time are also important in evaluating whether an individual student has higher skill at the end of the school year than at the beginning. The individual growth-curve analyses highlighted the uneven development of word-specific reading (real words) and phonological decoding (pseudowords) in some beginning readers. Those who grew in both were the better readers (see Table 2), but failure to grow in one did not rule out growth in that skill the following year (see Table 7). It is important not to give up on slower responders. With sufficient instruction (not merely maturation as some teachers believe), children may grow in each skill, although not necessarily at the same time.

This longitudinal study also suggested instructional components that might be added to phonological awareness and phonological decoding for the slower responders. Specifically, these children may benefit from explicit instruction in how phonemes correspond to two-letter as well as one-letter spelling units. Ability to learn correspondences for the two-letter spelling units uniquely predicted their reading achievement outcome after continued intervention. Both ability to code two-letter units in words represented in short-term memory and ability to manipulate phonemes in spoken words in short-term memory may affect ability to learn spelling-phoneme correspondences in alphabetic principle. Much of the predictability of English spelling involves spelling units larger than the single letter (Venezky, 1970, 1995), so it makes pedagogical sense to make explicit to beginning readers that the size of the spelling unit corresponding to a phoneme may vary (Berninger, Abbott et al., 2000). Initially, phonics instruction should focus on the correspondences between phonemes and single-letter spelling units, but eventually the correspondences involving two-letter spelling units should be introduced. The *Talking Letters Manual* (Berninger, 1998) outlines a sequence of how to teach them that was validated in prior intervention studies. Further research is needed on which learner characteristics predict who will benefit from instruction in which the most frequent spelling-phoneme correspondences are introduced within a relatively short time interval (e.g., four months) versus over a relatively longer period (e.g., two years).

Although we did not find a beneficial effect of adding syllable awareness training to alphabetic principle training, children improved in word learning when syllable awareness was included. The syllable awareness training did not hinder their word reading development. It may be that simply teaching words (see the Appendix) that contained exemplars of the seven syllable types in each lesson was sufficient to develop syllable awareness — at least at the level of implicit knowledge. It is also possible that the beneficial effect of syllable awareness training depends on skill domain and developmental level.

For teaching spelling to third graders at-risk for writing disability, syllable awareness training had some beneficial effects (Berninger, Vaughan et al., 2000). Further research is needed to evaluate whether the observed beneficial effect of pairing summarization with alphabetic principle training replicates.

This longitudinal research adds to a growing body of research that questions the validity of diagnosing reading disability solely on the basis of IQ-achievement discrepancy based on one-time administration of IQ and achievement tests (e.g., Berninger & Abbott, 1994; Fletcher et al., 1994; Siegel, 1989; Vellutino, Scanlon, & Lyon, 2000; Vellutino, Scanlon, & Tanzman, 1994, 1998; Vellutino et al., 1996). The longitudinal study contributes to that line of research by demonstrating that four subtypes of readers may emerge in response to early intervention: (a) faster responders who have a persisting relative strength in reading comprehension, (b) faster responders who have a persisting relative strength in word reading, (c) slower responders who have a persisting relative strength in word reading, and (d) slower responders who have a persisting relative strength in reading comprehension. We speculate that (a) the first subtype has the best prognosis; (b) the second subtype should be monitored for possible specific comprehension disability in the later grades; (c) the third subtype may need varying degrees of ongoing support throughout schooling if expected to achieve at grade level as they fall below the mean but in the normal range in verbal ability; and (d) the fourth subtype should be monitored for dyslexia throughout elementary school. The fourth subtype is the one that is most likely, if not given early intervention of appropriate intensity and duration, to show genetically constrained IQ-achievement discrepancy (see Olson, Datta, Gayan, & DeFries, 1999). Educational policy and federally mandated services should address the needs of all four subtypes, not just those who exhibit IQ-achievement discrepancies of an arbitrary size.

Although IQ-achievement discrepancy did not predict individual growth and is irrelevant, IQ was not completely irrelevant. It did differentiate the faster and the slower responders, but was only one of several variables that differentiated them. Prior to intervention, these groups differed on all the language variables in Table 1, which included orthographic, phonological, and rapid naming skills. In response to intervention, substantially more of the faster than the slower responders showed individual growth in both real-word and pseudoword reading (see Table 1). Variables that differentiated the groups showing individual growth in word and/or pseudoword reading compared to the group showing zero growth in either kind of word reading included Verbal IQ and orthographic, phonological, and rapid naming skills. Variables that differentiated those who grew in only real-word reading from those who grew in both pseudoword and real-word reading included rapid naming of letters and letter cluster coding in short-term memory, both of which are relevant to applying orthographic skills to alphabetic principle. Verbal codes (phonemes) must be applied to letter codes quickly because of time constraints in short-term memory, and sometimes two-letter functional spelling units are involved. In fact, among the slower responders who received continued tutoring, skill with two-letter spelling units uniquely predicted pseudoword reading outcome after (not before) treatment in second grade (see Table 5), which in turn was unqiuely predicted by phoneme deletion skills at the beginning of first grade (see Table 6). Therefore, not only phonological but also orthographic skills are important in applying alphabetic principle to phonological decoding.

## NOTES

[1]Examples of high-intensity intervention are the 340 hours of specialized instruction (Brown & Felton, 1990), the 35 to 65 hours of individual tutoring (Vellutino et al., 1996), the 174 hours of classroom-based instruction (Foorman et al., 1998), the 80 minutes of tutoring a week for two years (Torgesen et al., 1997), and the 200 minutes a week of instruction for 8 months (Torgesen et al., 1999) that at-risk beginning readers received. Reading Recovery (see Shanahan & Barr, 1995) is also a relatively intensive individualized early intervention.

[2]We use the term "slower responder" rather than "treatment resister" to emphasize that some children can learn to read adequately if given intervention of sufficient duration and that there are individual differences in rate of reading acquisition that fall in the normal range in learning to read.

[3]We use the term "spelling unit" to refer to functional spelling unit, a term Venezky (1970) introduced to emphasize that a phoneme may map onto either a one- or two-letter unit. Although the term "grapheme" used by linguists includes both single and multiletter units, we prefer the term "spelling unit" to clarify that the number of letters in the spelling unit that corresponds to a phoneme may vary. Many teachers and children assume mistakenly that English words can be read letter by letter going left to right and do not realize that for purposes of phonological decoding the written word must be parsed into one, two or more letters before recoding the spelling into phonemes.

[4]Of the RAN and RAS measures, only RAN letters were entered into these analyses.

[5]Monitor Only Group, Asian American, 6; Black American, 1; European American, 34; Hispanic, 2; unknown, 1. Mother's level of education, < high school, 2; high school, 10; community college/vocational, 12; college, 16; graduate degree, 2; unknown, 2.

[6]Continue Tutor Group, Asian American, 6; Black American, 3; European American, 35; Hispanic, 1; Other or Unknown, 3. Mother's level of education, < high school, 0; high school, 16; community college/vocational, 17; college , 13; graduate degree, 2.

[7]Texts included *Kermit and Robin's Scary Story* by Michaela Muntean, 1995, New York: Penguin; *Small Pig* by Arnold Lobel, 1988, New York: Harper Trophy; *She Sells Seashells* by Grace Kim, 1995, New York: Scholastic; *The Missing Tooth* by Joanna Cole, 1988, New York: Random House; *The Best Teacher in the World* by

Bernice Chardiet and Grace Maccarone, 1990, New York: Scholastic; *The Blind Men and the Elephant* by Karen Backstein, 1992, New York: Scholastic.

[8]A complete set of the lesson plans is available from the first author.

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## Appendix

### *Sample List of Words[a] Taught That Appeared in Storybook Read Later*

| Word on List | Syllable | Syllable Type | Syllable | Syllable Type |
|---|---|---|---|---|
| pencil | pen | closed | cil | closed |
| landed | land | closed | ed | closed |
| paper | pa | open | per | r-controlled |
| began | be | open | gan | closed |
| middle | midd | closed | le | le |
| uncle | unc | closed | le | le |
| story | stor | r-controlled | y | open |
| mother | moth | closed | er | r-controlled |
| outside | out | vowel team | side | silent e |
| nicer | nice | silent e | er | r-controlled |
| playing | play | vowel team | ing | closed |
| ready | read | closed | y | open |
| again | a | schwa | gain | closed |
| upon | u | schwa | pon | closed |

[a]Each word list, which was taught and reviewed over the four sessions in which the storybook that contained these words was read, contained at least two exemplars of each of the syllable types. Children saw only the word list (alphabetic principle training only) or the word list and seven Speaking Syllable Cards (reproduced in Berninger, 1998) that represented each syllable type schematically, with C for consonant and V for vowel, diacritical marks for long and short vowels, and x over silent letters.

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