Handbook of Assessment in Persons with Intellectual Disability

Edited by Johnny L. Matson

International Review of
RESEARCH IN
MENTAL RETARDATION

Handbook of Assessment in Persons with Intellectual Disability

VOLUME 34

ST. MARY'S CITY, MARYLAND

Board of Associate Editors

VOLUME 34

EDITED BY

Johnny L. Matson

LOUISIANA STATE UNIVERSITY
DEPARTMENT OF PSYCHOLOGY
BATON ROUGE, LOUISIANA

ELSEVIER

AMSTERDAM • BOSTON • HEIDELBERG • LOND
NEW YORK • OXFORD • PARIS • SAN DIEGO
SAN FRANCISCO • SINGAPORE • SYDNEY • TOK
Academic Press is an imprint of Elsevier

SCHIEFELBUSCH INSTITUTE FOR LIFE SPAN STUDIES, THE U
OF KANSAS, LAWRENCE, KANSAS

R. MATTHEW REESE

DEVELOPMENTAL DISABILITIES CENTER, THE UNIVERSITY
MEDICAL CENTER, KANSAS CITY, KANSAS

I. INTRODUCTION

The history of the assessment of people with intellectual d
like the unfolding of an evolutionary tree. It goes back to the
day research and practice as well as to the roots of many socia
cases, it has been a life-and-death matter, as in the Supren
Atkins v. Virginia (2002), which ruled against capital punis
with ID. This controversial case continues, however (Perske,
opment of IQ tests grew out of the need in the early 1900s to di
with ID, in order to predict school success better. Out of this
new definition of intelligence, the idea of general intelligence (
concept of intelligence consisting of several primary abilities.

IQ tests were also misused to set immigration quotas for
alities, to justify the eugenics movement, and to promote ste
these abuses grew the need in the 1930s and 1940s to assess a
skills, in order to broaden the concept of intelligence of p
reflect its social aspects more accurately.

As the awakening of the community and personal emp
ments emerged in the 1950s, the need to assess personalit
psychopathology, and behavior problems, which were impe
pendence and community integration, became more imp
carefully.

0074-7750/07 $35.00 DOI: 10.

purposes of entitlement (MacMillan, Gresham, & Siperste
than as a prescription for programming. The 2002 revision (
2002) reduced the areas of life-functioning supports needed f
a new "supports intensity scale" has been developed (Thomp
to assess them.

As federal entitlements to services for people with ID grew
standardized measures on work performance, social skills,
opment, quality of life (QOL), family adaptation, psycho
efficacy of psychopharmacology developed in the latter half
century. At first, these measures were an extension of instr
dized on the nondisabled population; but, as the research
became clear that tests standardized on specialized subpopu
were the most valid and reliable.

Another movement which greatly affected assessment
ID during this period was the advancement of the field of a
analysis (ABA) in the 1960s. As an alternative to psyc
referenced tests, ABA assessment relied totally on *in vivo* f
ment in the context of the target environment, identify
consequences that influenced behaviors, and modifying ther
Wolf, & Risley, 1968). Single-subject designs were espou
group designs. Functional assessments were later standa
Iwata, Dorsey, Slifer, Bauman, and Richman (1982) by col
standard analogue setting, using standard stimuli and reinfo
gencies, to analyze and predict what would work in the *in viv*
technique called functional analysis (FA) and its variants h
popular in the last 24 years in the United States, especiall
behavior problems of people with ID.

Matson in his handbook *Assessing the Mentally Retar*
Bruening, 1983) was one of the first to address the assessmen
as a field in itself. As the current volume shows, this field ha
dously in the last 23 years into a more mature discipline with
specialized assessment instruments available for research an
have superceded their earlier progenitors. There really is no ex

years ago (Berkson, 2004). Rosen, Clark, and Kivitz (1976
best general recent histories of ID from the Greeks up to
concepts of people with ID varied from subjects of scorn to
viewing them as fools in the middle ages. Luther and Calvin
as "filled with Satan." Some of these attitudes still persis
third-world countries people with ID are still seen as a p
God, and they are kept in seclusion.

Assessment of people with ID did not become an issue un
century when humanitarian institutions and training
springing up. From descriptions of the living conditions o
Massachusetts by Dix (1843), it is apparent that little disti
between the mentally ill, criminals, the poor, and people wi
to be segregated from society. Being labeled as "mentally
small matter to an individual.

The first systematic descriptions of people with ID as a sep
in need of training were by Itard in 1838 and Seguin in 1842 (R
Training schools followed quickly in Europe and in the Uni
Seguin moved to the United States, these institutions quic
Massachusetts, Ohio, Connecticut, Pennsylvania, Kentucky,
Minnesota, Indiana, California, Michigan, and Nebraska b
Itard and Seguin, physicians ran all of these facilities. They w
psychological or behavioral assessment methodology. They
their residents' retardation levels. As might be expected, the
reliability among their assessments. According to Wolfensbe
first efforts were "to make the deviant undeviant" (1850–18
"sheltering the deviant from society" (1870–1890), and the
society from the deviant" (1880–1900).

The above circumstances led to Binet's work on a stand
of "inferior states of intelligence" for diagnostic purposes
1905). In 1904, the French Minister of Public Instruction ch
sion to study the measures to be taken to ensure the "benef
to defective children." Binet wrote a scathing review of exis
systems and then published his own test in 1906, to different

the medically oriented institutions and led to a more cus
approach, that is the self-contained colony or total insti
attitudes toward people with ID soon began to reappear ar
people with ID again emerged.

IQ tests were given widely, not just in schools, but for a va
The Army General Classification Test was a group IQ test a
Stanford–Binet scales in 1917 when the United States entere
the World War I, to classify army recruits for different job
people who were unfit for military service.

Inspired by nineteenth century hereditarians like Francis G
the eugenics movement, several of its proponents like Te
and Yerkes (who was then a colonel in the Army) proposed
set immigration quotas for different races, as an argument
and as justification for other discriminatory practices of th
order (Kamin, 1974). An example of their rhetoric follow
(1916, 1917): "Children in this group should be segreg
classes.... They cannot master abstractions, but they can
efficient workers.... There is no possibility at present of co
that they should be allowed to reproduce... They constitute
because of their unusually prolific breeding. If we wou
state for a class of people worthy to possess it, we must p
possible, the propagation of mental degenerates... the incr
degeneracy."

Thus began the debate over heritability of intelligence, wh
day (see Eysenck & Kamin, 1981 for an excellent summary o
On one side were Terman, Eysenck, Jensen (Jensen, 19
who believed that 80% of intelligence was inherited; on
Kamin and others who disputed the data, some of which
(e.g., Cyril Burt's twin studies). Their view was that environ
ple caregiving environment, socioeconomic status, and oc
parents also played a large role in determining IQ. This de
the development of the culture-free test movement and to se
concerning the use of IQ tests in school placement (Larry P

ARC-US, it is the major advocacy organization for pe
the United States.

Although there were early textbooks, for example Tredgol
on the experimental psychology of "mental deficiency," as i
began in earnest after the World War II in the 1940s (see Ro
2003 for a review). The *American Journal on Mental Defici*
existence since 1895. Ellis published his *Handbook of Mental D*
and Research in 1963 (Ellis, 1963). It was one of the first handbo
solely to reviews of research and theory, and it served as the
for many years. It is now in its third edition. Since then, many
and annual series have been published on a wide variety of top

Research on educational assessment also began to app
(PCMR, 1977). The federal funding for research in me
received a huge boost in the 1960s during John F. Kenne
The National Institute for Child Health and Human Develo
and the Bureau of Education for the Handicapped (BEH)
1963 and in 1968, respectively. Advocacy for special educ
great impetus from the Education of All Handicapped Act
(since 1997 called the Individuals with Disabilities Educatio
guarantees every school-aged child a free and appropri
the least restrictive environment possible. For most chil
the public schools, which must be accessible and accomm
disabilities. Thus their right to education is extended to th
Any school receiving Federal and State funds must comply
or face losing its Federal and State funding.

These and other federal agencies promoted basic and
on the fundamental processes underlying assessments of
Experimental scales and test batteries based solely on theo
ability substructures, for example Clausen (1966), howe
success. Psychometrically standardized tests based on "
Stanford–Binet test, or on primary abilities, for example
gence Scales (Wechsler, 1955), and behavioral assessment
example FA, have prevailed up to the present.

IQs. Zigler (1969) proposed that this difference was mainl
for higher functioning people and not a fundamental dif
of motivation. Thus the developmental versus difference
Zigler & Balla, 1982 for a summary) was born, and it preo
the research of that period.

It was also noticed that the variability of responsivenes
people with ID than in typically developing people. This
to "outer-directedness," "rigidity" (Zigler, 1966) and lac
(Baumeister & Kellas, 1968).

The interest in personality structure of people with ID ca
researchers at Yale University headed by Zigler and his col
and Masland. Masland, Sarason, and Gladwin (1958) publ
early textbooks on "mental subnormality," which took an
approach to biological, psychological, and cultural factors
of research is still being carried on by their students. Ps
approaches to psychopathology predominated in this sch
(Sternlicht, 1966).

Behavioral approaches to psychopathology began with pe
and profound ID. Bijou (1966) and colleagues at the Universit
Lovaas at UCLA and his students (Lovaas, Freitag, Go
1965), Spradlin and colleagues at the University of Kansa
Spradlin, 1964), and Sidman and colleagues at the Shriver C
(Sidman & Stoddard, 1966), as well as other behaviorists a
States began dealing with basic skills such as daily living
skills, and behavior problems like aggression and self-inj
Two important societies were formed in the late 1960s: the
Behavior Therapy (AABT) and the Association for Behavi
former was broader and more eclectic, while the latter was
analytic, focusing on single-subject assessment and interve
were behavioral and opposed to the psychodynamic zeitgeis

Epidemiological research on populations related to ID als
a boost. An early study by Heber (1961) put the preva
retardation in the United States at 3%, a very significant

mental retardation. He coined the term "dual diagnosis" to
who have both mental retardation and mental illness simulta
number of pioneering child psychiatrists made people with
population of professional interest.

Many other handbooks followed in the next two dec
devoted to all aspects of psychopathology in ID. At firs
made to use instruments that had been validated on the typ
population, for example the Conners Teachers Questio
1969), but these often had limited validity for the more
severely retarded population.

In the 1980s, a second generation of new instrument
assessing psychopathology in people with ID were develop
Screening instruments like the Reiss Screen (Reiss, 1988) an
the psychopathology instrument for mentally retarded adul
and the Diagnostic Assessment of the Severely Handic
Gardner, Coe, & Sovner, 1991) were general multifactorial
ment instruments that are still used widely for the diagnosis
among people with ID. By 1990, Aman (1991) was able t
instruments that had at least some validation research sup
They ranged from self-report scales to interviews, ra
and behavior frequency measures. In the past 15 years m
multifactorial assessment scales have developed which
Chapters 5–9 of this volume.

With the increased interest in genetics and in behavi
(Dykens, 1995; Dykens, Hodapp, & Finacune, 2000), a n
tion of assessment instruments has developed, in order to
specific to the behavioral idiosyncrasies of different genetic
independent scales have been developed, in order to assess n
symptoms and their possible relationships to gene-brai
tionships. A good example is the battery of tests for repe
disorders, for example tics, dyskinesias, compulsions, stere
injury developed by Bodfish and colleagues (Bodfish
Lewis & Bodfish, 1998) or the Behavior Problem Invento

IV. ASSESSMENT OF PSYCHOPHARMACOLOG

In the 150-year history of research on the psychophar
(see Schroeder et al., 1998 for a historical review), the
antipsychotic drugs in the 1950s caused a sea change in
drugs, originally designed to treat schizophrenia and aff
were used extensively on a trial-and-error basis with peop
had no formal diagnosis of mental illness. This practice led
use and abuse, as pointed out in a critical review by Spr
(1971). Their classic paper set the standards for acceptable
psychopharmacology of ID: (1) double-blind, (2) placebo-c
ple standardized doses, (4) reliable evaluation of depe
(5) random assignment of participants, (6) appropriate sta
These standards, though rarely met due to limitations, the I
consent and to their high-risk nature, are still the gold stan

Since 1971, the use of psychotropic medications has decreas
(Valdovinos, Schroeder, & Kim, 2003). Although they are still
there are now state regulations governing their use, mon
review, drug holidays, reporting of adverse drug reactions, a
critical reforms all came about only with the developmen
assessment instruments standardized on the ID population. W
these trends briefly below. A fuller treatment is in Chapter 8.

As in other domains, early research studies on psychop
ID used psychiatric rating scales developed for the mentally
the Clinical Global Impressions Scale (Guy, 1976), and o
questionable validity in the ID population. Some of them h
at all or they were insensitive to drug effects (Schroeder, R
1997). The National Institute of Mental Health (NIMH)
workshops in 1983–1985 with researchers who were using th
to discuss their use and to make recommendations. These
published in two issues (Vol. 21, Nos. 2, 4) of the *Psyc*
Bulletin in 1985. The results led to use of more standard
procedures. The most powerful drug-sensitive and widely us

correlated poorly across different scales, and not at all behavioral observations (Schroeder et al., 1997); (3) the u side effects scales and measures of adverse drug effects wer the ID population, and new side effects scales, such as t MOSES, needed to be devised for this population (see Kalac excellent review); (4) it was rarely the case that a perso psychiatric diagnosis. Multiple diagnoses were the rule ra ception in this population (Valdovinos et al., 2003). Toge were the source of a great deal of variability in the data addressed in the future by a multimodal approach to appro observation sampling procedures (Thompson, Felce, & Sym specific and sensitive psychometric scales (Bodfish & Lewis, precise diagnoses to justify a more targeted neurobiologi using medication when it is necessary (Schroeder et al., 199

V. ASSESSMENT OF BEHAVIOR PROBLEMS SKILLS DEFICITS IN ID

As Baumeister, Todd, and Sevin (1993), Aman, Sarph (1995), and Valdovinos et al. (2003) point out, the most psychotropic medications used for *behavior problems* am ID are the antipsychotics prescribed for behavior contro self-injury, and property destruction. This has been th 1950s, even though these are not recognized psychiatric di IV (APA, 1994). The DSM has been slow to acknowledge c prevalence and severity of some of the behavior problems t people with ID. Traditionally these problems have been behavioral research community. Matson (1986) called for a two systems of assessment, but it has not as yet happened.

The vast majority of research on assessment and interven ior problems in ID is published in behavioral journals lik *Applied Behavior Analysis* (JABA), *Research in Developm*

more specialized scales, like the Behavior Problems Inventor
2001), are likely to continue as the prevailing instrument
behavior problems in ID.

Social skills assessments took on importance with the pu
Vineland Scales of Social Maturity (Doll, 1965). Later the a
scales (Nihira, Foster, Shellhaas, & Leland, 1975) became pop
a formal part of the AAMR definition of mental retardatio
revised definition (Luckasson et al., 1992, 2002). Concerns wi
tive behaviors were becoming of increasing interest as peo
retardation were leaving institutions for community living, bu
were not particularly helpful for prescriptive programmi
emphasized mostly negative behaviors and not their positive

Since behaviorists were doing most of this type of socia
they naturally turned to a task analysis, functional assessm
teaching of the behaviors. One of the first examples of such
the Mimosa Project at Parsons State Hospital and Training C
(Girardeau & Spradlin, 1964) where, using tokens as rewa
severely retarded adolescent girls self-care skills, as well
graces, for example sitting, eye contact, voice modulation, fa
ing, ironing, shopping in the community, and other social s
and Lawler (1964) reported on a similar program in an ed
with severely and profoundly retarded children.

Ayllon and Michael (1959) were among the first to propo
application of behavioral principles toward management usi
omy. Ayllon and Azrin (1968) published a comprehensive
token economy system. This very heuristic book was an im
and many replications occurred in institutions across the
Indeed we were working at an institution at the time in wh
different token economies involving over 600 residents, a
different levels of functioning. It had its own store, its own
system, to adjust the value of the token, and so on. It beca
that the state learned about it, felt it was a true economic sy
and shut it down because they could not account for it in

the assessments were behavioral demonstration of the co
than a psychometric test. Since most of the programs w
"treatment package," controversies developed over which p
age were the essential ingredients. This was difficult resear
it was labor-intensive and often it required a large number
the ID population is very heterogeneous, this was often i
problems were lack of generalization and maintenance ac
difficulty with people with more severe and profound ID
developed booster retraining and training-the-trainer str
these difficulties.

VI. ASSESSMENT OF SPEECH, LANGUAGE, COMMUNICATION IN ID

Language and communication are an integral part of ID, as
existence of language components on almost every IQ test.
1960s, the field of speech, language, and hearing, however, wa
on speech articulation and speech impairments. Norm-referen
Illinois Test of Psycholinguistic Abilities (Kirk & McCarthy,
to prescribe rather nonspecific "psychoeducational" langu
grams in the schools. Some textbooks essentially recommen
language training among people with ID.

The first systematic research program to study the co
people with mental retardation began at the University
Bureau of Child Research and Parsons Research Center in
the direction of Richard Schiefelbusch and Joseph Spradlin

Saunders, Spradlin, and Sherman (2006) give a concis
Language and Communication Program at the University
following section relies heavily on their historical account.
ning, Kansas researchers participating in this effort as
speech and communication of children and adults with m
could be improved by the systematic application of beha

they interacted. The first language sampling assessment ins
Parsons Language Sample (Spradlin, 1963).

In the late 1950s and early 1960s, many prominent research
States did not believe that the speech and language develop
with mental retardation could be enhanced or modified in
way via environmental means. Chomsky (1959), for exampl
his criticisms of Skinner's book (Skinner, 1957) and had pro
that generative grammar was innate. Statements by Cho
psycholinguists about the innateness of language led Kans
initiate a series of studies which demonstrated that many
grammar, whether thought to be innate or not, could still b
the systematic application of sound behavior principles (Bae
Guess, Sailor, Rutherford, & Baer, 1968; Schumaker & She

While these early studies were aimed at demonstrating
aspects of spoken language could be taught, there was also
the substantial importance of receptive language. Because he
critical to such understanding and because there were no
evaluating the hearing of children with severe mental reta
researchers at that time conducted a series of studies aim
procedures for evaluating the hearing of such children. T
to a set of procedures that could be used to evaluate suc
audiometric procedures previously applicable only to pers
stood and followed verbal directions (Fulton & Spradlin, 197
Lloyd, Spradlin, & Reid, 1968). Parsons researchers also
atic study of the development of generative receptive langu
they demonstrated that generative receptive language cou
with many children, to at least a limited extent, by the sys
tion of behavioral principles (Baer & Guess, 1971; Striefel &
Striefel, Wetherby, & Karlan, 1976). These early successes i
that some children with severe mental retardation could
aspects of generative language led to subsequent attemp
comprehensive program for language and communication
dren with severe and profound mental retardation (Guess,
1978).

PECs system (Bondy & Frost, 1994), are now used wide
communicators with ID.

The failure of children who had been taught specific lang
these skills in their daily environments also led Kansas resea
look carefully at those environments. Observation of the chil
environments (at that time these were typically institutional e
to the conclusion that they frequently did not have sufficien
use their newly developed skills. These observations led to a
opments. One development was that investigators began to
the interaction of persons with mental retardation and their c
natural (i.e. noninstitutional) environments (Hart & Risley,
of these efforts to observe children and their caregivers led a m
another research program by Hart and Risley. In this research
examined the communicative interactions of young childr
environments who were just beginning to develop langua
resulted in the publication of a seminal monograph by
(1995), that examines the development of language by chi
syndrome in comparison to that of typically developing child

The observation that the systematic teaching of languag
alize led Stokes and Baer (1977) to develop a model of the pr
facilitate generalization. They proposed this in a classic
served as a basis for both the experimental clinical analysis
problems and tactics for nearly three decades.

In the mid-1970s Kansas researchers began to develop
intervention procedures to be used in the children's natu
to aid them to acquire and use new skills (Hart & Risley, 19
Sherman, 1978). Hart and Risley (1975) developed an in
technique that encouraged children to request objects in th
ments. Pla-Check assessment systems for sampling behavio
settings were developed in this program. Halle and his c
Baer, & Spradlin, 1981; Halle, Marshall, & Spradlin, 197
that if one introduced a delay between the time that a child m
request and then prompted speaking by presenting a sp
person would often begin requesting with speech after a few

Timler, et al., 2003). So Terman's (1916) previously cited gene
no abstraction among people with ID were slightly inaccurat

Research on speech, language, communication, and
has exploded since the 1980s. Several large handbook seri
The first was a 20-volume series published by Univer
with Schiefelbusch and colleagues as editors. The second
series published by Paul Brookes Publishing Co. with Ste
Reichle, and Marc Fey as series editors, which continues
above behavioral research has used primarily the master
language abilities as their assessment measures (Sundberg
has developed a wide array of valid and reliable measu
development (Warren & Yoder, 1997). Standard compu
for analysis of language samples are now available (Evan
excellent book on the assessment of language relevant to ID
and Thal (1996).

VII. WORK-RELATED ASSESSMENT IN I

With the deinstitutionalization and community integratio
the 1970s came a renewed emphasis on assessing and d
related behaviors in ID, in order to foster productivity an
The federal Rehabilitation Services Administration (RSA)
lished after the World War II, to help wounded veterans' re
reentry into the nation's work force. This large federal age
network of branches in every state, which determined eligib
itation counseling, and monitored of clients' progress regu
these services were extended to people with mental illness, as
with ID, in the Rehabilitation Act of 1973.

RSA was not set up well for people with ID, and initi
great deal of resistance accommodating the new populati
were again norm-referenced aptitude tests, like the Purdu

OSERS, with David Gray, a quadriplegic and a strong adv
director. The newly formed Rehabilitation Research and Tr
NIDRR stressed consumer control, self-determination, an
which relied heavily on structured interviews of people
assessment tools.

Since that time a host of work-related programs for pe
addition to other disabilities, have developed. A large atte
move people with ID from sheltered employment into compet
in the community. Out of this impetus grew the supported em
ment (Rusch, 1990; Wehman, 1981; Wehman & Moon, 198
sample and vocational testing methods were largely discarde
performance skills on the job became the main set of assessm

Supported employment has been a successful program
totally replaced sheltered employment facilities. Only a sm
people with ID in supported employment work full time or
itive wage today. It was found that the main reason fo
supported employment was not so much the quality of the
lack of social skills in the work place, lack of responsibility,
such as their health, the economy, or intolerance of their fe
managers (Lagomarcino, 1990). Recent programs have foc
work-related social skills or self-employment (Chadsey-Ru
& Hammis, 2003; Luecking, Fabian, & Tilson, 2004; M
Oliphant, Husch, & Frazier, 2002).

The Americans with Disabilities Act (ADA) was passe
G.H.W. Bush administration. It had many far-reaching p
which was that it prohibited discrimination based on
It required employers to make reasonable accommodatio
person's disability, so that now even people with severe ID
to work. A large body of case law governing the ADA has de
past 15 years, but much of it has been gutted during the pa
Supreme Court during the G.W. Bush administration (Sto
Sublet, 2006). Total US public spending for ID has decr
(Braddock & Hemp, 2006).

important. The first QOL assessment scale in ID with empiric
by Schalock and Keith (1993). It was similar to QOL scales
health field and in the field of aging. It covered eight domains
being, interpersonal relations, material well-being, person
physical well-being, self-determination, social inclusion, and
of these domains has become a subfield of extensive resea
has spread to the international arena (Schalock et al., 200
Schalock et al. (2005), QOL has become a "sensitizing notion,
and overarching theme for planning, delivering, and evalu
lized services and supports." Assessment research on QOL c
rapidly, especially in the United States and Europe.

Another research initiative that emerged with the comm
in ID in the 1980s is *adaptation to having a person with*
(see Stoneman, 1997 for an excellent overview). The areas of s
stress models (McCubbin & Patterson, 1983), buffers and c
(Turnbull et al., 1993), family systems theory, social roles (S
Davis, & Crapps, 1989), and ethnographic approaches (Gal
Kaufman, & Bernheimer, 1989), models of grief, resilience
empowerment (Turnbull & Turnbull, 2001). Much of the ass
areas is qualitative or ethnographic in nature; but there are a
tative direct observational studies of social interactions, as w
questionnaires, ratings scales, and so on. Family studies in I
very large area of research in the last 20 years and they promise
in the future, as people with ID increasingly come to live in th

IX. INTERDISCIPLINARY TEAM ASSESSMENT

The assessments described above have become tools of
teams. Interdisciplinary teams have a long history and ha
medicine, education, and rehabilitation since the 1920s (
Interdisciplinary teams did not start to gain momentum un
centers were established during World War II. Professionals
a number of specialities were needed to adequately assess a

needed to be provided in an interdisciplinary fashion. The co
mended that centers be established for the interdisciplinary t
sionals who would eventually work with people with me
University Affiliated Facilities and Programs were develop
States to meet the need of training professionals to work in co
Mandates for collaborative interdisciplinary teams became
tional law in 1975 with Public Law 94–142, Education of
Act and subsequently the IDEA. Both University Affiliated
University Centers of Excellent in Developmental Disabi
continue today with emphasis on interdisciplinary assessment
education and treatment (Garner, 2000; Rainforth, York, & N
Thayer & Kropf, 1995).

Presently, interdisciplinary teams who support individu
retardation to function in their home community are made up
range of participants than therapeutic professionals such a
workers OTs, PTs, speech and language pathologists, an
Parents have always been important team members but mor
may represent a broad membership base and include clergy,
portation specialists, and city planners. The goals of teams a
only specific functional skills such as speech, social skills, and
but also a person's QOL including relationships with nor
and the ability to function as valued citizens in self-determ
employment settings. Many person-centered planning team
neighbors, community members, and so on who meet on a
move the person with mental retardation forward in improvi
lifestyle (Kincaid, 1996).

X. SUMMARY AND FUTURE DIRECTION

The above brief overview attests to the growth and dev
field of assessment in ID over the last century. The future pro
prolific expansion of existing domains as well as developm
Some trends are as follows:

great advantage in the field of learning disabilities and shou
in ID. Although used in some psychopathological and p
logical research in ID, the multimodal approach has not ga
popularity in the rest of the field.

3. Social validity assessments, although recommende
25 years (Kazdin & Matson, 1981), have also not been use
future, they are likely to be required more frequently, in or
access to research populations in ID.

4. Interdisciplinary assessment is increasingly becoming
important part of assessing people with mental retardatio
expensive, its wise and efficient use may save money in the l
of its emphasis on prevention of disabling conditions.

The importance of defining and characterizing populatio
ID cannot be overemphasized. Improving our assessments h
delineate subgroups empirically and thereby to sharpen th
genetic syndromes and to relate them to brain function and
day in the near future, there may be cures for some forms
therapy and organ repair with stem cells. Behavioral an
assessments have an integral role to play in these hopes and

ACKNOWLEDGMENTS

We wish to acknowledge MCH Project No. MCJ 944 and the Social Sec
for partial support in preparation of this manuscript. We thank Michael W
reading of the manuscript.

REFERENCES

Aman, M. G. (1991). *Assessing psychopathology and behavior problems in
retardation: A review of available instruments*. Rockville, MD: US D
and Human Services.

Baer, D. M., & Guess, D. (1971). Receptive training of adjectival inflections
Journal of Applied Behavior Analysis, 4, 129–139.
Baer, D. M., & Guess, D. (1973). Teaching productive noun suffixes
children. *American Journal of Mental Deficiency, 77,* 498–505.
Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensior
analysis. *Journal of Applied Behavior Analysis, 1,* 91–97.
Baumeister, A. A., & Kellas, G. (1968). Reaction time and mental retarc
(Ed.), *International review of research in mental retardation* (Vol. 3
York: Academic Press.
Baumeister, A. A., Todd, M. E., & Sevin, J. A. (1993). Efficacy and spe
logical therapies for behavioral disorders of persons with mental
Neuropharmacology, 16, 271–294.
Berkson, G. (2004). Intellectual and physical disabilities in prehistory a
Mental Retardation, 42, 195–208.
Bijou, S. W. (1966). Functional analysis of retarded development. In N. F
tional review of research in mental retardation (Vol. 1, pp. 1–19). N
Press.
Binet, A., & Simon, T. (1905). Upon the necessity of establishing a scientifi
states of intelligence. In A. Binet & T. Simon (Eds.) (1916). *The devel*
in children (pp. 9–36). Baltimore: Williams & Wilkins.
Birnbrauer, J. S., & Lawler, J. (1964). Token reinforcement for learning. *M*
275–279.
Bodfish, J. W., & Lewis, M. H. (2002). Self-injury and comorbid behavic
neurological, psychiatric, and genetic disorders. In S. R. Schroeder, M
T. Thompson (Eds.), *Self-injurious behavior: Gene-brain-behavior rela*
Washington, DC: American Psychological Association Books.
Bondy, A., & Frost, L. (1994). The delaware autistic program. In S. Harr
(Eds.), *Preschool education programs for children with autism* (pp. 37–54
Braddock, D., & Hemp, R. (2006). Growth for US public spending for
mental disabilities slowed down 2002–2004. *Mental Retardation, 44,*
Brady, N. C., McLean, J. E., McLean, L. K., & Johnston, S. (1995). In
intentional communication acts by adults with severe to profound
Journal of Speech and Hearing Research, 38, 1334–1348.
Carrier, J. (1974). Application of functional analysis and a nonspeech respo
language. *American Speech and Hearing Monograph No. 18*, Washir
Chadsey-Rusch, J. (1990). Teaching social skills on the job. In F. R
ported employment: Models, methods and issues (pp. 161–180). Syca
Publishing Co.
Chomsky, N. (1959). A review of B. F. Skinner's verbal behavior. *Langua*

6, 51–60.
Doll, E. A. (1935). A genetic scale of social maturity. *American Journal o*
180–188.
Doll, E. A. (1965). *Vineland Scale of Social Maturity*. Minneapolis, MN:
Service.
Dykens, E. M. (1995). Measuring behavioral phenotypes: Provocations fro
American Journal on Mental Retardation, 99, 522–532.
Dykens, E. M., Hodapp, R. M., & Finacune, B. M. (2000). *Genetics an*
syndromes: A new look at behavior and interventions. Baltimore,
Publishing co.
Ellis, N. R. (Ed.) (1963). *Handbook of mental deficiency.* (1st ed.). Hill
Erlbaum Associates.
Evans, J. L. (1996). Plotting the complexities of language sample anal
P. S. Dale, & D. J. Thal (Eds.), *Assessment of communication and lan*
Baltimore, MD: Paul Brookes Publishing Co.
Eysenck, H. J., & Kamin, L. (1981). *The intelligence controversy*. New Yor
Sons.
Fulton, R. T., & Spradlin, J. E. (1971). Operant audiometry with severe
Audiology, 10, 203–211.
Fulton, R. T., & Spradlin, J. E. (1972). SISI procedures with the severely
Speech and Hearing Research, 15, 217–224.
Fulton, R. T., & Spradlin, J. E. (1974a). Puretone threshold measurement. I
Auditory stimulus-response control (pp. 37–52). Baltimore, MD: Univ
Fulton, R. T., & Spradlin, J. E. (1974b). The short increment sensitiv
R. T. Fulton (Ed.), *Auditory stimulus-response control* (pp. 53–64). Balti
Park Press.
Gallimore, R., Weisner, T. S., Kaufman, S. Z., & Bernheimer, L. P. (1989).
tion of ecological niches: Family accommodation of developmenta
American Journal on Mental Retardation, 94, 216–230.
Garner, H. (2000). *Helping others through teamwork: A handbook for profes*
DC: CWLA Press.
Girardeau, F. L., & Spradlin, J. E. (1964). Token rewards in a cotta
Retardation, 2, 345–352.
Goddard, H. H. (1913). The improvability of feeble-minded children. *Journ*
17, 121–131.
Griffin, C., & Hammis, D. (2003). *Making self-employment work for pe*
Baltimore, MD: Paul Brookes Publishing Co.
Grossman, H. J. (Ed.) (1973). *Manual of terminology and classification i*
Washington, DC: American Association on Mental Deficiency.

stimulus control procedure to increase language use in handicapped
Applied Behavior Analysis, 14, 398–409.
Halle, J. W., Marshall, A., & Spradlin, J. (1979). Time delay: A technique
use and facilitate generalization in retarded children. *Journal of Appl*
12, 431–439.
Hart, B., & Risley, T. R. (1980). *In vivo* language intervention: Unantic
effects. *Journal of Applied Behavior Analysis, 13,* 407–432.
Hart, B., & Risley, T. R. (1975). Incidental teaching of language in the
Applied Behavior Analysis, 8, 411–420.
Hart, B. M., & Risley, T. (1995). *Meaningful differences in the everyday*
American children. Baltimore, MD: Paul H. Brookes.
Heber, R. (1959). A manual of terminology and classification in mental r
Journal of Mental Deficiency, 64 (Monograph Supplement No. 2) ix,
Heber, R. (1961). *Epidemiology of mental retardation.* Springfield, IL:
Publisher.
Horowitz, F. D. (1963). Partial and continuous reinforcement of vocal re
vocal, and smiling reinforcers among retardates: Part 1. *Journal of*
Disorders: Monograph Supplement No, 10, 55–69.
Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K., & Richman, G. S. (1982
analysis of self-injury. *Analysis and Intervention in Developmental Disab*
Jensen, A. R. (1969). How much can we boost IQ and scholastic achieven
tional Review, 39, 1–123.
Kalachnik, J. E. (1999). Measuring side effects of psychopharmacologic
duals with mental retardation. *Mental Retardation and Developmental*
Reviews, 5, 348–359.
Kamin, L. J. (1974). *The science and politics of IQ*. Potomac, MD: Erlbau
Kazdin, A. E., & Matson, J. L. (1981). Social validation in mental retardat
in Mental Retardation, 1, 39–53.
Kincaid, D. (1996). Person-centered planning. In L. K. Koegel, R. L. K
(Eds.), *Positive behavior supports: Including people with difficult behav*
(pp. 425–438). Baltimore MD: Paul H Brookes.
Kirk, S., & McCarthy, J. (1961). Illinois Test of Psycholinguistic Abili
differential diagnosis. *American Journal of Mental Deficiency, 66,* 339
Kuder, G. F. (1934). *Kuder preference record: Vocational.* Chicago, IL: Scie
ates, Inc.
Lagomarcino, T. R. (1990). Job separation issues in supported employm
(Ed.), *Supported employment: Models, methods, and issues* (pp. 301
Sycamore Publishing Co.
Larry P. v. Riles, 343 Supp. 1306(N.D. Cal.1972).

Reeve, A., et al. (2002). *Mental retardation: Definition, classification*
ports (10th ed.). Washington, DC: American Association on Mental
Luecking, R. G., Fabian, E. S., & Tilson, G. R. (2004). *Working relationsh*
Paul Brookes Publishing Co.
MacMillan, D. L., Gresham, F. M., & Siperstein, G. N. (1993). Conceptu
concerns about the 1992 definition of mental retardation. *America*
Retardation, 98, 325–335.
Martin, J. E., Mithaug, D. E., Oliphant, M., Husch, J. V., & Frazier, E. S.
employment. Baltimore, MD: Paul Brookes Publishing Co.
Masland, R. L., Sarason, S. B., & Gladwin, T. (1958). *Mental subnormal*
Basic Books.
Matson, J. L. (1986). Self-injury and its relationship to diagnostic schemes
Applied Research in Mental Retardation, 7, 223–228.
Matson, J. L. (1988). *The psychopathology instrument for mentally retard*
Oak Park, IL: International Diagnostic Systems.
Matson, J. L., Gardner, W. I., Coe, D. A., & Sovner, R. (1991). A scale for
disorders in severely and profoundly mentally retarded persons. *Britis*
try, 159, 404–409.
Matson, J. L. & Bruening, S. E. (Eds.) (1983). *Assessing the mentally retar*
Grune & Stratton.
McCubbin, H. I., & Patterson, J. (1983). The family stress process: The dou
adjustment and adaptation. In H. I. McCubbin, M. B. Sussman, & J.
Social stress and the family: Advances and developments in family stres
(pp. 7–37). New York, NY: Halworth.
McLean, J. E., McLean, L. K. S., Brady, N. C., & Etter, R. (1991). Comm
two types of gesture using nonverbal persons with severe to profound
Journal of Speech and Hearing Research, 34, 294–308.
Menchetti, B., Rusch, F. R., & Owens, S. D. (1983). Vocational training
S. E. Bruening (Eds.), *Assessing the mentally retarded* (pp. 247–28
Grune & Stratton.
Menolascino, F. J. (Ed.) (1970). *Psychiatric approaches to mental retarda*
Basic Books.
Nihira, K., Foster, R., Shellhaas, M., & Leland, H. (1975). *AAMD Ad*
manual (revised edition). Washington, DC: American Association on
Perske, R. (2006). Strange shift in the case of Daryl Atkins. *Mental Retard*
President's Committee on Mental Retardation (1977). *MR 76: Century*
present. Washington, DC: US Government Printing Office. Stock No
Rainforth, B., York, J., & Macdonald, C. (1992). *Collaborative teams for*
disabilities. Baltimore, MD: Paul H Brookes Publishing Company.

Routh, D. K., & Schroeder, S. R. (2003). A history of psychological th
mental retardation since World War. In L. Masters-Glidden (Ed.), *I*
research in mental retardation (Vol. 26, pp. 1–59). New York, NY: A
Rusch, F. R. (Ed.) (1990). *Supported employment: Models, methods, and*
Sycamore Publishing Co.
Rutter, M., Tizard, J., & Whitmore, K. (1970). *Education, health, and beha*
John Wiley & Sons.
Saunders, K. J., O'Donnell, J., Vaidya, M., & Williams, D. C. (2003). Re
zation of within-syllable units in nonreading adults with mental re
Applied Behavior Analysis, 36, 95–99.
Saunders, M. D., Timler, G., Cullinen, T. B., Pilkey, S., Questad, K. A
(2003). Evidence of contingency awareness in people with profound r
Response duration versus response rate indicators. *Research in Devel*
24, 231–245.
Saunders, R. R., Spradlin, J. E., & Sherman, J. A. (2006). Communic
mental retardation program project. In R. L. Schiefelbusch & S.
Doing science and doing good: A history of the bureau of child research
institute for life span studies 1921–2006 (Book II, Ch. 7). Baltimor
Publishing Co.
Schalock, R. L., & Keith, K. D. (1993). *Quality of life questionnaire.* W
Publishers.
Schalock, R. L., & Verdugo, M. A. (2002). *Handbook on quality of l*
practitioners. Washington, DC: American Association on Mental Re
Schalock, R. L., Verdugo, M. A., Jenaro, C., Wang, M., Wehmeyer, M.,
(2005). Cross-cultural study of quality of life indicators. *America*
Retardation, 110, 298–311.
Schroeder, S. R., Rojahn, J., & Reese, R. M. (1997). Reliability and valid
assessing psychotropic medication effects on self-injurious behavior i
Journal of Autism and Developmental Disorders, 27, 89–102.
Schroeder, S. R., Bouras, N., Ellis, C. R., Reid, A., Sandman, C., Werry, J.
(1998). Past research on psychopharmacology of people with me
developmental disabilities. In S. Reiss & M. G. Aman (Eds.), *Psy*
and developmental disabilities: The international consensus handbook.
Ohio State University.
Schumaker, J., & Sherman, J. A. (1970). Training generative verb usa
reinforcement procedures. *Journal of Applied Behavior Analysis, 3,* 2
Schumaker, J. B., & Sherman, J. A. (1978). Parent as intervention agent. I
(Ed.), *Language intervention strategies* (pp. 237–315). Baltimore, M
Press.

International review of research in mental retardation (Vol. 2, pp. 279–3
Academic Press.
Stokes, T. F., & Baer, D. M. (1977). An implicit technology of generalizatio
Behavior Analysis, 10, 349–367.
Stoneman, Z. (1997). Mental retardation and family adaptation. In W. E.
handbook of mental deficiency, psychological theory and research (pp.
NJ: Lawrence Erlbaum Associates.
Stoneman, Z., Brody, G. H., Davis, C. H., & Crapps, J. M. (1989). Ro
mentally retarded children and their older siblings: Observations in thr
Research in Developmental Disabilities, 10, 61–76.
Stowe, M. J., Turnbull, H. R., & Sublet, C. (2006). The supreme court
disability policy: Boardrooms and bedrooms, courtrooms and cloakr
dation, 44, 83–99.
Striefel, S., & Wetherby, B. (1973). Instruction-following behavior of a re
controlling stimuli. *Journal of Applied Behavior Analysis, 6,* 663–670.
Striefel, S., Wetherby, B., & Karlan, G. R. (1976). Establishing generative ve
following skills in retarded children. *Journal of Experimental Child Psy*
Sundberg, M. L. (1983). Language. In J. L. Matson & S. E. Bruening
mentally retarded (pp. 285–310). New York, NY: Grune & Stratton.
Terman, L. M. (1916). *The measurement of intelligence*. Boston, MA: Hou
Terman, L. M. (1917). Feeble-minded children in the schools of California.
5, 161–165.
Thayer, B. A. & Kropf, N. (Eds.) (1995). *Developmental disabilities: A Ha*
plinary Practice. Cambridge, MD: Brookline Books.
Thompson, T., Felce, D., & Symons, F. (2000). *Behavioral observation*. E
Brookes Publishing Co.
Thompson, J. R., Bryant, B., Campbell, E. M., Craig, E. M., Hughes, C., &
(2004). *Supports Intensity scale (SIS)*. Washington, DC: American A
Retardation.
Tiffen, J. (1968). *Purdue Pegboard*. Chicago, IL: Science Research Associa
Tredgold, A. J. (1937). *Mental deficiency*. New York, NY: Wood.
Turnbull, A. P., Patterson, J. M., Behr, S. K., Murphy, D. L., Marquis, J.
(1993). *Cognitive coping, families, and disability*. Baltimore, MD: Paul Br
Turnbull, A. P., & Turnbull, H. R. (2001). *Families, professionals, and exc*
Columbus, OH: Merrill Prentice-Hall.
Valdovinos, M., Schroeder, S. R., & Kim, G. (2003). Prevalence and corre
medication use among adults with developmental disabilities: 1970–20
(Ed.), *International Review of Research in Mental Retardation* (Vol. 2
York, NY: Academic Press.

Wolfensberger, W. (1972). *Normalization: The principle of normalizatio*
Toronto: National Institute on Mental Retardation.
Zigler, E. (1966). Research on the personality structure in the retardate.
International review of research in mental retardation (Vol. 1, pp. 77–
Academic Press.
Zigler, E. (1969). Developmental vs. difference theories of mental retardatio
motivation. *American Journal of Mental Deficiency, 73,* 536–556.
Zigler, E., & Balla, D. (1982). *Mental retardation: The developmental vs. a*
Hillsdale, NJ: Lawrence Erlbaum Associates, publishers.

This page intentionally left

ROWLAND P. BARRETT

EMMA PENDLETON BRADLEY HOSPITAL, DEPARTMEN
PSYCHIATRY AND HUMAN BEHAVIOR, THE WARREN ALPERT M
OF BROWN UNIVERSITY, PROVIDENCE, RHODE ISLA

I. ASSESSING MENTAL RETARDATION US STANDARDIZED INTELLIGENCE TESTS

Mental retardation is a categorization for a heterogeneou duals with deficits in cognitive and adaptive functioning man 18th birthday. It is not a medical disorder, although it ma medical classification of diseases. Further, despite its inclusion of the American Psychiatric Association's *Diagnostic and Sta Mental Disorders* (American Psychiatric Association, 1952, 1994, 2000), mental retardation is not a mental disorder. Ra tion in development that can increase the risk of mental d Barrett, 2000). In general, the definition and categorization o tion refers to a level of behavioral performance without refe (Sattler, 1992).

Mental retardation has been recognized perhaps longer th we currently study in psychiatry and psychology. Qualitativ persons manifesting what we now describe as mental re found in historical records that date as far back as to the E 1500 BC and to the Babylonian Law Codes some 1000 years Hooper, & Barrett, 1987). Even before the concept of i be measured, mental retardation had been viewed as a dis deficits in intellectual ability. An early formal definition of m includes the one by Tredgold (1908): "A state of mental defe from an early age, due to incomplete cerebral developmen

0074-7750/07 $35.00 DOI: 10.

tion took on a clear, quantifiable component (i.e., intelligenc
IQ) with a classification system based on numerical scores ar
From this period forward, intelligence, as measured by IQ, h
as the primary criterion for diagnosing mental retardation. T
tration of a standardized intelligence test has come to play
diagnostic process. Indeed, until 1959, scores on these me
sole criteria by which an individual was first diagnosed a
category with regard to presence and level of impairment of me
In 1959, the American Association on Mental Deficiency'
definition (Heber, 1959) introduced the additional criteri
areas of adaptive behavior.

Today, individually administered intelligence tests contin
role in the diagnosis of mental retardation. A deficit score o
administered intelligence test is the first of three criteria an
meet to be diagnosed as mentally retarded (deficit perform
functioning and manifest before age 18 are the other two
Consequently, measures of intelligence play a crucial role in t
children and adolescents with mental retardation. This cha
an overview of the various standardized intelligence tests us
throughout the developmental period of birth through age 18
reaching the diagnosis of mental retardation. It also will pr
specific to this evaluation process of young individuals with
tion. Finally, the oftentimes complicated nature of these yo
profiles will be reviewed; examples of psychological rep
clinical cases will be shared.

II. DEFINITIONS OF MENTAL RETARDATIO

While there has been debate over the definition and classif
retardation for several decades, the debate has focused pri
related to epidemiological research, specifically, conceptual

The AAMR (2002) defines mental retardation as "... a
terized by significant limitations both in intellectual functio
tive behavior as expressed in conceptual, social, and practic
This disability originates before age 18" (p. 8). Accordin
(2002), the intellectual criterion requires an IQ of ~2 o
deviations (SD) below the mean, or an IQ of 70 or below
adaptive behavior criterion, the AAMR (2002) manual
scores on adaptive behavior measures for a diagnosis of me
In this area, the individual must have scores of at least
mean on either (1) one of the following three types of a
(i.e., conceptual, social, or practical) or (2) a total score o
measure that includes an assessment of conceptual, social, ar

B. American Psychiatric Association Definition

The American Psychiatric Association's (2000) *Diagnost*
Manual of Mental Disorders, Fourth Edition, Text Revisio
defines mental retardation as "... significantly sub-average
tual functioning (Criterion A) that is accompanied by signi
in adaptive functioning in at least two of the following ar
tion, self-care, home living, social/interpersonal skills, us
resources, self-direction, functional academic skills, work
and safety (Criterion B). The onset of mental retardation m
age 18 years" (p. 41). Consistent with the AAMR (2002) d
for significantly subaverage intellectual functioning generall
be an IQ 2 or more SD below the population mean, usuall
below. However, *DSM-IV-TR* (2000) states that an IQ of
constitute the criterion in some settings.

C. Individually Administered Intelligence Test

The AAMR (2002) definition and the *DSM-IV-TR* (200
state that significant subaverage intellectual functioning m
results of an appropriately standardized, individual

AAMR's (2002) more recent position of incorporating meas
only in the initial diagnosis.

In contrast, the American Psychiatric Association in
(2000) continues to distinguish four categories of mental re
on degrees of severity. These include: mild mental retard
mental retardation, severe mental retardation, and profound
tion. The *DSM-IV-TR* (2000) specifies IQ ranges for each
gories. The IQ ranges overlap each other, typically by five
as follows:

Mild mental retardation: IQ = 50–55 to ~70
Moderate mental retardation: IQ = 35–40 to 50–55
Severe mental retardation: IQ = 20–25 to 35–40
Profound mental retardation: IQ less than or = 20–25

This overlap in range is a result of the difference in the stat
of the measures used to determine intellectual functioning. Re
purposes of diagnosis, subaverage intellectual functioning is
of 2 or more SD below the established mean IQ for the tes
example, with the −2 SD criterion being used, then the IQ
−2 SD point is 69 for the Wechsler tests (Wechsler, 199
Stanford-Binet V (Roid, 2003b), and the Leiter Internatio
Scale-Revised (Roid & Miller, 1997) but 67 on the Bayley Sc
Toddler Development (Bayley, 2005), the McCarthy Scal
Abilities (McCarthy, 1972), and the original Leiter Internatio
Scale (Leiter, 1948). The cutoff points vary because the forme
of 15, whereas the latter tests have a SD of 16. Other c
categories of mental retardation may be appropriate for ot
depending on the SD of the test; however, the –2 SD criteri
Table I shows the classification system of mental retard
measured intelligence when various intelligence tests are emp
functioning (discussed in Dixon, this volume) consistent w
mental retardation also is important in the final classification

Profound	24 and below

Given that measures of intelligence play a crucial role in
children and youth with mental retardation, such categori
retardation also may have some bearing on the standardized
an examiner will choose for the evaluation process. For ex
Wechsler intelligence tests are frequently used in the asses
retardation in children and adolescents, the lowest Full
obtainable on a Wechsler test is a 40. Consequently, the
adequately measure IQs below 40. This issue will be disc
depth later in this chapter.

A. Mild Mental Retardation

Individuals in the mild range of mental retardation comp
persons diagnosed with mental retardation (Ameri
Association, 2000). The IQ scores for these individuals fal
50–55 to 70. Comparable limitations in adaptive behavior
Etiologically, this group is frequently referred to as being i
psychosocial) group of retardation. Individuals in this grou
are those who fall in the lower portion of the normal distri
gence. The reasons for their relatively weak intellectual
difficult to decipher; however, they are likely secondary to
of causes or some combination of them. This may include: (
heredity; (2) normal polygenic variation, that is the combine
genes; (3) subclinical brain damage yet to be diagnosed;
below-average environment, that is low early stimulation, c
low socioeconomic status (SES), poverty, and so on. T
also typically have one or more family members who also
cognitive and adaptive functioning (particularly in the
Seldom present are neurological or apparent physical abno

work independently without coming to the attention of
service community. This integration may be secondary
intellectual limitations are more obvious in school setting
employment settings and community experiences. Further,
a result of a gradual accumulation of adaptive skills and
abilities acquired during the formative years of formal educa
education services. In general, prevalence estimates suppo
mental retardation are much higher for young children tha
et al., 2001). This is not inconsistent with the position th
with mild mental retardation may integrate into society wit
little difficulty when compared to those individuals wh
development was more seriously impaired.

B. Moderate, Severe, and Profound Mental Retardation

Individuals in the moderate, severe, and profound ranges
dation, together, make up the remaining 15% of all indivi
with mental retardation (American Psychiatric Association
scores of this group falls into the IQ range of more than
established mean IQ for the test employed. Generally, this tra
to 50–55, 20–25 to 35 to 40, and less than or equal to 20–25,
each level, comparable limitations with regard to adaptive
are present. Etiologically, these three levels of mental retard
referred to as the organic (or biological) group. The etiolog
group appears to be principally associated with: (1) a gen
linked to single gene effects [e.g., phenylketonuria (PKU)], (
abnormalities (e.g., Down's syndrome), and (3) brain dam
cephaly). With regard to the latter, such brain damage ma
diffuse (generalized encephalopathy) in nature. Neuroanato
tions of the brain also may be present. There is a high pro
origination of the damage is during the prenatal period.

succeed very well in roles as semiskilled or unskilled wo
support and/or assistance in most areas of daily living typic

2. SEVERE MENTAL RETARDATION

Individuals with severe mental retardation are commo
infancy as they manifest obvious delays in acquiring mot
skills. Physical abnormalities are not unusual. While indivi
mental retardation acquire some basic self-help skills, they
independently and require daily support and supervision
entire lives.

3. PROFOUND MENTAL RETARDATION

Individuals with profound mental retardation are typic
birth or soon thereafter. Early identification is usually se
apparent physical abnormalities and/or compromise. Delay
and basic skill acquisition are readily apparent beginning in
compromise and/or abnormalities may hinder or preclu
ambulate or speak. Others will have to take on responsib
care and activities of daily living for individuals with p
retardation. This level of care will be lifelong.

IV. STANDARDIZED INTELLIGENCE (IQ) TES

A. What Intelligence Tests Measure

Standardized intelligence tests are ability tests. Ability
level of knowledge or skill in a particular area. Young c
evaluated to determine the progress of their development.
assess ability in motor, language, social, or cognitive skills.
are ability tests in that they assess overall intellectual fu
provide information about the individual's repertoire of co
knowledge at a given point in time.

been set from the results achieved by using the test with ind
representative of the population. For those readers intere
description and debate on: (1) theories of intelligence, (2) v
gence as a construct, (3) measurement and change of i
(4) pros and cons of testing intelligence, the reader is referred
and Locurto (1991). In general, it is best to keep in mind that
do not measure innate intelligence or capability. IQs are c
ability. These scores are only a part of the spectrum of an indi
IQ scores do change, and IQ scores obtained from different
interchangeable.

B. Why IQ Tests Are Administered and What IQ Tests Can Reveal

An intelligence test can be administered for a variety of reas
of such testing can provide information for the purposes of: (
(2) diagnosis, and (3) educational or occupational programm
tion that includes an intelligence test may be administered to
current developmental level or cognitive abilities. It also m
to ascertain a particular diagnosis for an individual. Furthe
that includes an intelligence test may be carried out to g
about: (1) groups of children, (2) degree of success of an educa
program, or (3) level of success of a treatment. Finally, intellig
be administered in effort to set up a treatment protocol for eit
or a program/facility.

C. Stability and Change in IQ Scores for Mentally Retarded Children

The IQ obtained from standardized intelligence tests is
work with children who are mentally retarded. While corr
Developmental Quotients obtained on infant tests and IQs
childhood tend to be very low for those with average or supe

tests during their first 20 months of life, are likely to obtain later periods of development. Seventy-three percent of infan to profound mental retardation, as assessed by the Bayley classified as severely mentally retarded 1–3 years after the (Brooks-Gunn & Lewis, 1983). Generally, infants who s retarded ranges on developmental scales during the first y high probability of obtaining scores in the mentally retarc their school years. Infants with developmental quotients likely to remain severely impacted.

However, these findings are not an endorsement of di retardation via a single test score in infancy. On the contr are found to be slow at an early age can make gains rapidly mental periods. Consequently, repeat evaluations should such a child at later ages for verification of cognitive s for review and modification of educational programmin protocols currently in place. Some very young children w suffered from stimulus deprivation, that is their environ so nonstimulating that it prevents them from developing children who then demonstrate continued decreases in I the preschool years tend to be those whose homes or enviro to manifest minimal stimulation (Dennis & Najarian, 19 routines, and either a very severe or a very inconsistent c In contrast, children previously identified with low IQs w strate subsequent increases in IQs during the preschool those whose homes or environments have undergone modif ent with structure, consistency, and age-appropriate stimu attention and encouragement are given in a clear ma Najarian, 1973; Sattler, 1992). In general, the consequence environments, although quite serious, can be remedied to improving the levels of attention, stimulation, and nurtura onments of affected children (Dennis & Najarian, 1973). occurs, the better the developmental outcome for the Najarian, 1973).

of mental retardation should be well-versed in the present profiles for a range of other disorders and problems frequen the preschool population. Table II lists a range of disorde in which an evaluator should be well-versed.

To aid in the process of diagnostic clarification, the ev well-served to conduct a first-time cognitive evaluation as pa ciplinary evaluation (e.g., such as those frequently compl Development Center). Having the benefit of shared informa from other disciplines may aid differential diagnosis a integrated recommendations. If an interdisciplinary evaluatio the evaluator should, at minimum, have access to a variety materials prior to evaluating the child. These should include: (1 and developmental histories; (2) developmental-pediatric eval and hearing evaluations; (4) speech and language evaluation (occupational therapy and physical therapy) evaluation.

A. Distinguishing Between Mental Retardation and Developmental Delay

When mental retardation is suspected in an infant or a pre the nondiagnostic condition of developmental delay should an alternative. The diagnosis of mental retardation should cases that clearly support significantly subaverage intellec and significant deficits in adaptive behavior.

Fotheringhan (1983) has outlined three reasons for disting mental retardation and developmental delay during thes infancy, toddler, and preschool years. First, while a child may criteria for mental retardation, intelligence measures prima opmental progress. Thus, repeated assessments over time check for changes in the rate of development and ascertain a Second, other conditions may mimic mental retardation. aphasia or cerebral palsy may limit a child's ability t and, therefore, negatively impact the assessment of a ch

(A) Autism
(B) Pervasive developmental disorder, not otherwise specified
(C) Rett's syndrome
(D) Childhood disintegrative disorder
(E) High-functioning autism
(F) Asperger's disorder
(G) Neurological inefficiency/nonverbal learning disability
(H) Attention deficit disorder
(3) Developmental language disorder
(4) Hearing impairment
(5) Visual impairment
(6) Cerebral palsy
(7) Motor coordination disorder
(8) Regulatory disorders
(9) Attachment disorder
(10) Elective mutism
(11) Psychosocial deprivation
(12) Other psychiatric conditions
(13) Some form of a behavioral disorder
(14) Dyadic problem between caretaker and child
(15) Challenging temperament and/or inconsistency of temperamen
caretaker and child

---

performance. Third, environmental circumstances also ma
pact a child's test performance which, if modified, might sign
a child's functioning (e.g., increasing adaptive functioning l
of mental retardation). Thus, as noted earlier in this secti
must be alert to the interrelatedness of developmental funct
level and possible alternative roots and causes of developme

When a child demonstrates impaired cognitive and ada
and a diagnosis of mental retardation cannot be reliably m
condition of developmental delay may be appropriate.
involved parties to a variety of possibilities that can includ
cognitive deficit is ambiguous, (2) the cognitive deficit may
nature, (3) the deficits in adaptive behavior are not signi

VI. CHOOSING AN INTELLIGENCE TEST FO
INDIVIDUAL SUSPECTED OF HAVING MENTAL RETA

Determining the test to be used for a particular child or a
be based on a careful review of the referral question and a
acteristics of the individual being evaluated. Important info
sider when choosing an assessment tool includes: (1) the
proficiency (in English and/or another language), (2) deve
(3) known physical and/or cognitive limitations, and (4) pri
their results.

All tests of cognitive ability are not alike. It is not enoug
iarity with one assessment measure and consistently use
determination of mental retardation. Intelligence tests ma
different populations, may have higher or lower levels o
validity, may be based on different conceptual models of
may assess intelligence using different modalities (verbal, vi
and so on). Particularly, in the case of individuals with kno
cognitive impairments, these factors will need to be taken in
choosing a diagnostic measure. The choice of test should be
an individual's performance on a given measure is maximize
a child with motor impairment may appear to demonstr
speed deficits" or deficits in "spatial reasoning" if assessed
dependent test. The newer tests of intelligence take into ac
such as these, to some degree, by offering alternative wa
different abilities. However, the prudent examiner may fin
cases, choosing a different assessment tool (or multiple asses
provide more accurate information for a given individual
prudent examiner will choose a measurement instrument b
presented, not on a particular bias. For this reason, the exam
regularly assessing children and adolescents for diagnostic
mental retardation will find it necessary to become familiar
intelligence assessment tools. Many of these assessment ins
part of the typical graduate assessment course experience
competency in administration and interpretation will re
training and practice on the part of the examining psycholo

measures (specifically, with regard to comparable psycho
as well as diagnostic and clinical utility) and when these al
are deemed more appropriate in the assessment of a given in

Finally, it should be noted that the many tests presented i
generally considered to be language-based measures of inte
language-based disability is suspected, steps should be ta
language-free measure of intelligence. Such language-free
discussed in a subsequent section of this chapter. Howev
never had a formal language or intelligence evaluation, it ma
to use a traditional, language-based measure in order to esta
level, particularly if language competence is part of the r
If the assessment reveals evidence of a language-based disa
tation of the IQ score(s) should be made with the caveat th
may have been attenuated by language functioning. In such c
free measure (e.g., Leiter International Performance Scale-R
be necessary in making the overall determination of mental

VII. INTELLIGENCE TESTS EMPLOYED FOR AS
MENTAL RETARDATION

The actual exercise of conducting a formal cognitive
toddler, child, or adolescent who presents with mental reta
challenging task. Indeed, consistently, it is a more challengi
to carrying out the same procedure with same-age typical pe
these authors' professional experience, it is never an imp
child is untestable. Even when the task is the evaluation of a
or profound mental retardation, some cognitive scores ca
One does not have to rely solely on informal assessment
functional assessment procedures. Cognitive measures can

A key component to success in this process lies in choosin
standardized measure(s) of intelligence. More often than no
test chosen will be from among the "gold standard" tests
child's particular age group (Exhibit 2.1). However, in so
entail using multiple standardized measures of intelligence

formal assessment of children presenting with mental retar
remiss not to stay abreast of these new instruments and to ev
instruments compare with older, more established measures. I
these newer tests being introduced, there are a handful of
instruments that continue to be robust measures for evaluat
senting with mental retardation. These include the follow
instruments.

EXHIBIT 2.1

Assessment Case Illustration #1

Traditional Assessment for Diagnosis of Mental Retardation: Use of a Single, Age-Appropriate Intelligence Test

PSYCHOLOGICAL EVALUATION

Name: Ian H.
Date of birth: 4-7-96
Chronological age: 9 years, 11 months
Chronological grade: Special education
Date of admission: 12-5-05
Dates of assessment: 3-17-06 and 3-24-06

REASON FOR REFERRAL

Ian is a 9 year, 11-month-old male who was referred for
evaluation by Dr. R., Seton Hospital Developmental Disa
(DDP) Psychiatrist. Specifically, testing was requested to d
levels of cognitive and adaptive behavior functioning to aid fu
placement and programming.

BACKGROUND INFORMATION

Ian was admitted to the Seton Hospital DDP on 12-5-05 du
increase in aggressive and self-injurious behavior at home an
Ian's fourth inpatient admission to Seton Hospital since Jan

his adoptive family, the H.'s, which includes his adoptive
one brother, and two sisters. Ian has lived with the H.'s sin
old, when he was brought into the family as a foster chi
removal from his biological mother's home. He reported
biological mother from the age of $1\frac{1}{2}$ to 2 years of age. V
his biological mother, Ian reportedly sustained multiple ab
ries, including a head trauma and multiple burn wounds. I
years of age, Ian lived with a foster family that was suspec
less than adequate care. Ian was initially removed from his b
at birth, when it was determined that he was born addicted

Ian's early developmental history is reportedly significant
of severe abuse as well as speech and motor difficulties. Ian'
is significant for perinatal cocaine addiction, closed head
seizure disorder.

Ian's developmental history is significant for the presence
ioral and emotional dysregulation. He has displayed ag
self, peers, school staff, and his family. In addition, he
obsessive-compulsive behaviors and sensory sensitivities.

Although the H.'s have been stressed with Ian's increasing
have provided a loving home environment for him and are h
his care. Since becoming a member of the H. family, I
intensive special education and supportive services. In add
has utilized intensive in-home and outpatient services in an
Ian's needs. Prior to inpatient admission, Ian was rece
special education services at school. Ian's behavioral escal
precipitated removal from his most recent special educatio

CURRENT MEDICATIONS

Lithium, 600 mg, bedtime
Abilify, 10 mg, 8 a.m.
Tenex, 1 mg, 8 a.m., 2 p.m.; 2 mg, bedtime
Adderall, 7.5 mg, 8 a.m., 12 noon
Zonagram, 100 mg, bedtime
Lamictal, 75 mg, 8 a.m., bedtime

Behavioral Observations

Ian was evaluated over the course of two sessions, eac
approximately one hour in length. This examination took
distraction-free environment. In order to obtain Ian's best
was provided verbal reinforcement and a sticker chart. I
effort on all test items presented. He appropriately incr
response time when presented with more difficult task ite
diligently even when presented with task items which appea
of his ability level. Ian's behavior across sessions was general
will be summarized as a unified narrative.

Ian presented as an appropriately dressed, well-groome
brown hair and light brown skin. He was of average he
average weight for a boy his age. He was friendly with
meeting but stated that he did not want to go to testing. Hov
changed his mind when he was reminded of opportunities f
for behaving appropriately. Transition to the testing site wa
Ian engaged in appropriate small talk on the way to the testi
not need redirection at any time while walking from one bui

Throughout the examination, Ian appeared to be relativ
organized. He did not appear to need frequent reminders
redirection while engaged in assessment tasks. He remaine
not appear overly fidgety or restless. Ian's focus and atten
decrease as item difficulty increased. However, Ian demonstr
effort throughout the evaluation, even on items that appear
of his ability range.

Ian seemed to respond well to and develop rapport easily w
Although he generally appeared affectively flat, he did parti
neous verbal exchanges with the examiner, and seemed so
Eye contact was socially appropriate during conversation.
testing, Ian used eye contact extensively as an attempt to
well he was performing.

Ian's responses to task items gave the impression of deper
become upset when help was not offered on task items. Con
he tended to be highly assurance seeking. He would freque

needed to be reminded to hold his paper when writing.

Given the consistency of Ian's behavior and performanc
sions, it can be reasonably concluded that this evaluation a
Ian's current functioning and abilities when provided
attention and a distraction-free environment.

Test Findings

Ian's intellectual functioning, as assessed by the WISC
Intellectually Deficit range. He obtained a Full Scale IQ (F
(mean = 100; SD = 15) which is over 3 SD below the mean
for children in Ian's age range. The chances are 95 of 100
FSIQ is between 42 and 54. In addition to his FSIQ, Ian o
Comprehension Index (VCI) of 63, a Perceptual Reasonin
53, a Working Memory Index (WMI) of 59, and a Proces
(PSI) of 53. These scores are all considered to be in the In
cient range of functioning. Ian's specific WISC-IV subscale
marized below (where mean = 10 and SD = 3):

Verbal Comprehension		**Perceptual Reas**
Similarities	5	Block Design
Vocabulary	3	Picture Concep
Comprehension	3	Matrix Reason
		Picture Comple
Working Memory		**Processing Spee**
Digit Span	2	Coding
Letter-Number Sequence	4	Symbol Search

[a]This score is based on a raw score of 0.

This deficit profile was further confirmed by results of the
tive Behavior Scales, a caretaker response inventory as
behavior skills domestically and in the community. For ind
age range, the Vineland measures the ability to perform dail

Receptive	–	2 years,
Expressive	–	4 years,
Written	–	7 years,
Daily Living Skills	63	–
Personal	–	4 years,
Domestic	–	4 years,
Community	–	5 years,
Socialization	61	–
Interpersonal relationships	–	3 years,
Play and leisure time	–	2 years,
Coping skills	–	2 years,
Adaptive Behavior Composite	62	–

Ian's domain scores are relatively consistent across do demonstrate a small (albeit, statistically insignificant) relati regard to community-based skills and written expression. scores in all domains reflect significant weakness when c same-aged peers in the general population.

SUMMARY

Ian is a 9 year, 11-month-old male who is currently an Seton Hospital DDP. He was admitted to the DDP as a resu increase in aggressive and self-injurious behavior. He wa psychological evaluation to assess current cognitive and ac functioning.

Results of this evaluation reveal cognitive functioning to be ally Deficient range, with a FSIQ score = 48 (more than 3 SD and adaptive behavior functioning to be in the low range of f SD below the mean). Taken together, findings indicate that Ia eligibility criteria for a diagnosis of Mental Retardation (M given significant subaverage cognitive and adaptive behavior

Behavioral observations obtained throughout the course o suggest that Ian tends to lack confidence in his ability to per independently, even those within his demonstrated ability le

dence of seizure activity, it is further recommended that
receive ongoing support and monitoring of his neurologica
recommendations based on the results of this assessment are

Behavioral Expectations

Ian appears to respond well to nonconfrontational expe
pliance. He will generally comply with a task demand if give
respond to a first request and if he is not engaged in a
However, once Ian appears highly disorganized and dysre
not be able to respond to verbal commands. This is likely t
stimulating environments.

Academic Functioning

Ian will benefit from instructional materials that are tailo
level of cognitive functioning. Ian will specifically benefit fr
to work independently on task items that are well with
functioning (independence level) in order for him to achiev
confidence in his performance. Items that are presented at
level (slightly above independence level) should be presente
instructional setting. For items presented at Ian's instructi
tive modeling is imperative. Specifically, using mistakes as i
should be modeled explicitly (and reinforced). In addition
constant assurance should be monitored and slowly (carefu

Emotional Lability/Obsessive Compulsive Symptoms

Ian will benefit from being provided with low-stimulation
decrease emotional lability. He may benefit from being expli
(developmentally appropriate) cognitive-behavioral and sel
tegies for dealing with emotionally overwhelming situations.
may benefit from the use of an overlearned visual or auditor
assist him in de-escalating and returning to baseline functio

It was a pleasure to evaluate Ian. If any questions o
regarding this report, please feel free to contact me at 800-5

EXHIBIT 2.2

Assessment Case Illustration #2

Assessment for Diagnosis of Mental Retardation Versus a Language Disorder: Use of Multiple Intelligence Tests (Verbal and Nonverbal Instruments)

PSYCHOLOGICAL EVALUATION

Name: Matthew B.
Date of birth: 11-18-98
Chronological age: 6 years, 6 months
Chronological grade: Kindergarten
Dates of assessment: 5-23-05 and 6-7-05

REASON FOR REFERRAL

Matthew is a 6 year, 6 month old Caucasian male refer
Outpatient Clinic of Seton Hospital for a comprehensiv
evaluation. He was referred by his parents to determ
level of functioning and to assist in educational progran
Mrs. B. were interested in obtaining a second opini
comprehensive evaluation conducted by the Bridgewater Sch

BACKGROUND INFORMATION

The following information was obtained via parent que
parent interview, and a thorough review of Matthew's educa
cal records. Matthew was the product of a 42-week uncompl
and normal vaginal delivery. Neonatal development w
by some respiratory problems and an undescended testicl
experienced an apnea episode at ~2 weeks of age which

both of which were within normal limits.

In February 2001, at 27 months of age, Matthew under ciplinary evaluation by the Infant Team at Cushing Chi Presenting concerns included delays in language and mot and physical growth and size. Matthew also was exhibiti behavior at that time. Psychological assessment via the Infant Development (Second Edition) revealed an age eq 16 months. Adaptive behavior skills were roughly within the as well. Results of a physical therapy assessment indicated fine and gross motor skills, feeding skills, and dressing skills a 15- to 17-month level.

In July 2001, Matthew was evaluated by Dr. J. of the Program at Cushing Children's Hospital. Dr. J.'s impr Matthew was not exhibiting a degenerative neurological disc genetic disorder. Dr. J. further stated that it was high Matthew's apnea was the cause of his subsequent pr Matthew's developmental delays and apnea were considered of a nervous system that, from birth, was not working as it no specific etiology could be identified, it was suggested problems were likely a result of atypical early brain develop there is no family history of neurological or developmental anticipated at that time that Matthew would continue to e steady developmental progression.

In January 2004, Matthew was evaluated by neurologist problems included impulsivity, inattention, and develo A trial of Ritalin was implemented ~2 months later. Ritalin in January 2005 for an unspecified reason.

Matthew underwent a triennial evaluation (Novembe Bridgewater School Department. On the Wechsler Pre mary Scale of Intelligence, Third Edition (WPPSI-III), a Verbal Scale IQ score of 58, a Performance Scale IQ sc FSIQ score of 48. Age equivalents for adaptive behavior parent report on the Vineland Adaptive Behavior Scales, Communication = 2 years, 9 months; Daily Living S 9 months; and Socialization = 2 years, 9 months. Results

visual model.

While Matthew's parents were not dissatisfied with the res
evaluations, they requested the present evaluation to confi
Matthew's functioning and obtain suggestions for his educa

PROCEDURES USED

Leiter International Performance Scale
McCarthy Scales of Children's Abilities
Vineland Adaptive Behavior Scales (parent informants)
Structured play/free play
Parent–child interactions
Clinical interview
Behavioral observations
Chart review

CURRENT MEDICATIONS

Matthew was not taking any medications at the time of t

CLINICAL FINDINGS AND IMPRESSIONS

Behavioral Observations

Matthew was evaluated over two separate sessions. Beha
tion was consistent across sessions. Consequently, results
meetings will be collapsed and reported as one integrated obs

For his initial session, Matthew was accompanied to the
by both of his parents. He appeared somewhat short in
chronological age, but generally well-nourished and well
general presentation was quite neat and he exhibited some a
ing (e.g., hands on his hips when making an emphatic com
clearly exhibited a positive attachment to his parents. On h
departure from the evaluation room, Matthew exhibited

He often sought eye contact and he made frequent attemp
attention. Matthew coordinated verbal and nonverbal com
well during his interactions with the examiner.

Matthew's language skills were significantly impaired, i
and expressive domains. His articulation also was quite poo
ly impacted listener comprehension. Matthew, at times, ap
by his language impairments and he occasionally exhibit
aggression (e.g., hitting the table) subsequent to communic
Matthew's nonverbal communication, on the other hand
well-developed. Indeed, Matthew may rely on his nonverba
skills as a means of compensating for his limited verba
Matthew communicates via a combination of modalities
expression, gestures, occasional sign language, and mode
wishes another to perform.

Matthew's behavior during formal testing was characte
tion, distractibility, and frequent protests in response to
He required excessive external structure. Matthew was
attempt tasks presented to him unless the task was broken do
and simple steps. When such structure was not provided, he
distractible, impulsive, and unable to complete his work. Th
Matthew frequently exhibited brief spurts of upper body ten
particularly in his hands and arms. These episodes lasted
seconds and appeared to function as discharges of energy
When demands became too great or when Matthew was
task, he protested by placing test materials in his mouth, k
items, or hitting the table with his hands. Such behavior
like that of a three-year-old than a six-year-old. Matthew
perform when given only one, simple task at a time, provided
structure, and allowed frequent breaks.

Matthew's affect was generally bright throughout
He exhibited a range of affect and his emotional expression
with the situation at hand. His overall mood appeared quit

with him in this activity. Matthew later engaged in a play game with the examiner but, again, he insisted on directing

Clinical interview with Matthew's parents revealed that M ior during this evaluation was generally consistent with his b in school, and in the community. Consequently, results o appear to be an accurate representation of Matthew's cur and abilities.

Test Findings

Given Matthew's significant language impairment, assess tual functioning via more traditional measures (e.g., V appeared inappropriate in that such tests rely heavily o expressive language and, as a result, might underestimate M functioning as well as provide little qualitative informa strengths and preferred modes of learning/problem solving. national Performance Scale, a standardized nonverbal me gence for individuals 3 years to 18 years of age, appeared n in that its major use is in the assessment of individuals with or other types of language handicaps. On this nonverbal te functioning, Matthew was able to pass all of the subtests level, three of the four subtests at a 4-year level, all of the su level, and two of the four subtests at a 6-year level. He fail the 7- and 8-year levels. This performance resulted in a ment 7 months and an IQ score of 70 (where the mean score = 10 This places his overall cognitive functioning at the very borderline range (mild mental retardation equals an IQ sco

Generally, Matthew's performance was best on tasks that matching of objects or color sorting. He was able to make sim between related objects but, for the most part, he was unable that required abstract reasoning or the ability to think concept academic skills are probably at, or below, the kindergarten Matthew evidenced low frustration tolerance and limited ab

McCarthy provides a General Cognitive Index (GCI) which is
rable to the FSIQ score on other standardized intelligence
Wechsler). Also, like a Wechsler, the McCarthy relies heavily
expressive language skill development, either in conveying th
pleted or in the actual completion of the task. However, unlike
assesses intellectual functioning across two domains (verba
[performance]), the McCarthy measures intellectual functi
dimensions: verbal ability; nonverbal reasoning; number apt
memory; and coordination.

Given Matthew's already noted weaknesses within the ve
marked discrepant scores between his earlier cognitive ev
Wechsler, a highly verbally based standardized intelligence
cognitive evaluation (on the Leiter, a standardized nonverbal
the McCarthy was administered to: (1) assess the reliability of
ler IQ score; (2) assess the impact of language on his performa
clarifying, more specifically, areas of relative strength and wea

On the McCarthy, Matthew's cognitive functioning fell
range of mental retardation, obtaining a GCI of <50. This
mensurate with his November 2004 WPPSI-III FSIQ scor
domain scale index scores and age equivalent scores were a

Scale	Index score (where mean score = 50)	Age eq (ye
Verbal (V)	<22	
Perceptual performance (P)	<22	
Quantitative (Q)	<22	
Memory (Mem)	<22	
Motor (Mot)	<22	

Again, it appears that when language is a mediating
completion, Matthew's performance is worse. Overall age
clustered between the 3- and 4-year level. Interestingly, wh

Puzzle solving*	4
Pictorial memory	2½
Word knowledge, I & II	2½
Number questions	4
Tapping sequence	3½
Right–left orientation*	5
Leg coordination	3
Arm coordination, I, II & III	3½
Imitative action	3½
Draw-a-design	3
Draw-a-child	4
Numerical memory, I	2½
Numerical memory, II	3½
Verbal fluency	4
Counting and sorting*	4
Opposite analogies	3
Conceptual grouping*	6

The above deficit profile was further confirmed by results Adaptive Behavior Scales (VABS), a caretaker report inv adaptive behavior skills domestically and in the community ing Matthew's adaptive behavior skills with same-aged pee population, he is functioning ~2–3 SD below the mean. C scores and age equivalent scores are summarized below.

Domain	Standard score (where mean score = 100)	Age equiva
Communication	49	2 years, 3 n
Daily Living Skills	64	4 years, 3 n
Socialization	69	3 years, 8 n
Motor skills	–	3 years, 10
Adaptive Behavior Composite	56	3 years, 6 n

Matthew makes gains with regard to communication skills, skills will similarly improve.

FORMULATION

Matthew is an adorable and engaging $6\frac{1}{2}$ year old boy wh history of global developmental delays. Given Matthew's developmental delay and continued even developmental p bined with the results of the present evaluation, togethe diagnosis of cognitive compromise is in order. However, th whether Matthew's cognitive functioning level is in the bor mild range of mental retardation, or the moderate range dation. It is clear that Matthew exhibited significantly be on a nonverbal test of intelligence (Leiter IQ score = 70) administered (November 2004) verbally based test of intelli FSIQ score = 48) and current verbally based test of intelli GCI score = <50). The 20- to 22-point difference between cannot be accounted for by measurement error alone. Ra that Matthew's language impairments interfere with his verbally based intelligence tests. Consequently, results o and McCarthy are likely to be an underestimation of Mat lectual abilities. Furthermore, it is probable that Matthew's ments interfere with his development of age appro behaviors such as social skills and daily living skills. Thu cognitive functioning likely being in the mild range of men borderline range, Matthew clearly appears to be manifes language disorder which cannot be subsumed under his di tive compromise. Indeed, until rigorous programming language skill development is put into place for Matthew ascertain whether cognitive level is actually in the borderli range of mental retardation. Consequently, it is imperative focus of Matthew's educational programming be the deve munication skills to foster optimum adaptive behavior ski functioning.

growth or the point at which his skill development will lev
given that speech and language issues still need to be address
important is that Matthew continues to receive intensive edu
with behavioral programming in place at home and at scho
his development of adaptive behavior skills.

RECOMMENDATIONS

1. Matthew will continue to require an intensive, langua
education program. A one-to-one format will likely be neces
his educational experiences in order to maximize his acade
ment in a classroom staffed by individuals with expertise i
agement will be critical. Matthew requires considerabl
external support in order to focus on academic material an
presented to him. Furthermore, it is strongly recommended
considered for an extended school year program. It is proba
educational services during the summer months, Matthe
regression in academic achievement.

2. Given Matthew's language impairments, it is imperativ
hensive, updated speech and language evaluation be cond
Matthew's performance during this testing, a primary goal o
program appears to be the development of a total commu
one that incorporates multiple communication modalities. I
tant that all verbal instructions for Matthew be accompanie
and materials to manipulate, where possible. Addition
Matthew with opportunities to observe other children perf
task before he is expected to act will be helpful. Use of a pict
may be useful for communication purposes and to assis
following classroom routines.

3. Continuation of speech and language therapy service
cated. The updated speech and language evaluation can n
point the level of services needed. Further, development
skills may be necessary at this time. Particular emphasis ma

ioral management concerns, identify appropriate expectatio
and obtain support in parenting a child with special needs. It
to focus on Matthew's development of independent behavio
skills. Development of a specific behavior program also
therapy. Mr. and Mrs. B. were provided with a list of loca
provide these specific types of outpatient family services.

6. Continuation of occupational and physical therapy se
recommended in order to address Matthew's fine and g
development.

7. Should Matthew's attention problems increase and i
academic achievement, Mr. and Mrs. B. may wish to consi
medication consultation. This service could be provided t
Outpatient Clinic here at Seton Hospital.

It was a pleasure to evaluate Matthew. Should any ques
arise regarding this report, please feel free to contact me at

EXHIBIT 2.3

Assessment Case Illustration #3

Assessment for Diagnosis of Mental Retardation When the Individual's Cognitive Functioning Level Is Too Low for the Appropriate Age-Normed Intelligence Test: Use of an Intelligence Test Normed for a Younger Chronological Age Group

PSYCHOLOGICAL EVALUATION

Name: Charles V.
Date of birth: 8-8-95
Chronological age: 9 years, 0 months
Chronological grade: Special Education
Date of admission: 3-27-04
Dates of assessment: 8-25-04 and 8-28-04

behavioral dysregulation (in the form of hitting, hair-pulli
away). Prior diagnoses include: Organic Mental Disorder
Specified; Developmental Disorder, Not Otherwise Specified.

Ring Chromosome 22 Syndrome (a genetic abnormality
mental retardation, distinct facial features, seizure disorders
behaviors). Other diagnoses in the long record at various p
history have included: Autistic Disorder; Profound Men
Diffuse Neurological Abnormalities Secondary to Chromoso
ty; Pervasive Developmental Disorder, Not Otherwise Specifi
tal Articulation Disorder; Developmental Expressive Langua
Developmental Coordination Disorder. A comprehensive re
prenatal, natal, medical, developmental, and family histo
been documented in his medical record. Consequently, it wil
again here. The reader is referred to that document for de
his inpatient hospitalization, a comprehensive psychologica
requested. Specific request was for evaluation of cognitive,
adaptive behavior, and behavioral functioning as well as r
for continued educational programming and services.

PROCEDURES USED

Leiter International Performance Scale (attempted)
Bayley Scales of Infant Development (Second Edition)
Vineland Adaptive Behavior Scales (staff informants)
Structured play/free play
Behavioral observations (evaluation room and classroom
Clinical interview
Chart review

CLINICAL FINDINGS AND IMPRESSIONS

Behavioral Observations

Charles was accompanied to this evaluation session by his
Kristen, who remained for the entirety of this evaluation
aided in administration of test items, task compliance,

He showed no interest at this initial point in any materia
room. Generally, with assistance and ongoing redirection
calm down and accepted sitting in a chair at the examinatio

Throughout formal testing, Charles required ongoing su
seated, to attend to task instructions, and to comply wit
Attention span was quite limited and ongoing redirectio
required. When uninterested in, or too greatly challenged b
demonstrated vocal and physical protests (e.g., bouncing in
to leave chair, and throwing objects across the table). C
attentive to test items and play materials that made noise; he
responsive and soothed by melodic music. Indeed, for the m
engagement with the environment appeared to be at the sen
Interactions with task/play materials were at the simple e
Frequent mouthing of objects was also an avenue of dis
material properties present. At no point did Charles enga
cooperative play. There were no instances of symbolic use

Overall, Charles' gross and fine motor development ap
for chronological age. His gait was wide-based and awkwa
appeared immature. He did demonstrate a good pincer g
left-hand preference. He employed an immature, full hand g
writing utensils. Facial muscle/motor movement was w
moderate drool. This, also, likely contributes to his immatu

Language development was severely impaired. Receptive la
stronger than expressive abilities as Charles was able to
respond to simple verbal instructions and commands. Exp
appeared limited to single syllable vowel-consonant com
ever, it should be noted that Charles' ability to listen and r
significantly as his attention faded.

For the most part, Charles displayed a quite limited
Displeasure in the form of crying and whining was mos
was pleasure in the form of very brief interest and atten
demonstrate aggression toward others. He did, however, e
head banging on four or five separate occasions, each
successfully with the use of a protective helmet. Such beha
emerged subsequent to a demand being placed on him.

Test Findings

Despite Charles' chronological age of 9 years, 0 months to complete standardized, cognitive instruments geared f (i.e., WISC-III or Leiter International Performance Scale the Bayley Scales of Infant Development (Second Edition although this test was not standardized on children in Charl provision of multiple items at or below Charles' functional le more accurate assessment of his relative strengths and weak

On the Bayley Scales of Infant Development (Second E achieved a basal score of 23–25 months, a ceiling score of Mental Developmental Index (MDI) of less than 50 (wher 100), and an estimated mental age equivalent of 19–20 month Charles' current cognitive/developmental functioning is in deficit range, and his overall functioning more closely appro 19- to 20-month old rather than a 9 year, 0 month old. It hence, developmental deficits were principally tied to his exp deficits, motor deficits, and marked inattention/distractibili

As noted in the behavioral observations section, Charles' l primarily tactile exploration, sensory stimulation, motor im ple cause-effect relationships. It is anticipated that slow dev gression will ensue with the continued ongoing benefit of inte modification and intensive interdisciplinary intervention ser

The above deficit profile was further confirmed by careta the Vineland Adaptive Behavior Scales, a caretaker report sing adaptive behavior skills domestically and in the co comparing Charles' adaptive behavior functioning with ch the general population, he is functioning $\sim 3\frac{2}{3}$ to 5 SD b Generally, it would appear that Charles' weak Socializa Daily Living Skills are negatively impacted by language an Overall standard and age equivalent scores are summarized

Given the past record diagnoses of Pervasive Develop
Not Otherwise Specified (2000) and Autistic Disorder (200
Autism Rating Scale (CARS) was completed. The CARS
rating system which quantifies the presence/absence and de
on 15 different dimensions which are characteristic of the a
Scoring results on the CARS indicate that Charles is no
autistic syndrome. Rather, his noted areas of difficulty were
mental retardation profile in the severe to profound range.
included: an even, flat cognitive profile, language impairm
culties, inattention, high activity level, and some self-injurio
relatively intact sensory responses and relatively good socia

SUMMARY

Taken together, Charles is a 9 year, 0 month old male pres
22 Chromosome Disorder. His overall profile reveals multi
appear to root in constitutional underpinnings. He presents
ness in all developmental domains, functioning like a to
months of age). His language, motor, and attention de
cognitive and adaptive behavior profile in the mentally retar
to profound). Slow, even developmental progression is
continued intensive behavioral modification programs, one
intervention services (Occupational Therapy, Physical Ther
and Language) as well as educational programming (w
functional life skills) and the assignment of a sole aide
expertise in behavior modification.

RECOMMENDATIONS

These findings should be incorporated with other spe
findings (i.e., Occupational Therapy, Physical Therapy, S
guage, and Education). Integrated recommendations sho
and documented in Charles' IEP. However, for purposes o
the following recommendations are most strongly offered:

occupational therapy, and physical therapy should be in pla

4. The curriculum should emphasize the development of munication, social interaction skills, and teacher-pleasing b ular emphasis should be on the development of social imag skills and the development of a functional communication tion, emphasis should be placed on the development of necessary for successful communication and social perform least restrictive environment.

5. Teaching should be based on a combined developm model using systematic instructional procedures. Speci imply targeting of skills to be acquired, positive consequen a clearly structured scope and sequence of lessons across domains, consistent and regular evaluation of progress o on a daily or weekly basis, and the use of various specific dures (i.e., discrete trial learning, task analytic teaching teaching) for instruction. Finally, the use of individual mo to establish and maintain appropriate academic behavior a zation and communication skills will be a very important school program.

6. Programming for the generalization of skills learned home must be a formal and structured process. Charles ne automatically generalize skills learned in one situation or wi new situations or other people. As such, it will be necessary t toward the generalization of skills taught in school, to h community.

7. If not already done, Charles should be referred to the Mental Retardation (DMR) for initiation of DMR services a

8. Mr. and Mrs. V. have provided a loving, creative, environment for raising Charles. Given the day-to-day cha with and raising a child with mental retardation and behav Mr. and Mrs. V. may wish to participate with the local DM for ongoing information and support about Charles' needs families such as their own.

A. Bayley Scales of Infant Development, Second Editio

The Bayley Scales of Infant Development, Second E
(Bayley, 1993) is the first revision to the original Bayley
Development (BSID) (Bayley, 1969). The BSID-II and its
long been the "gold standard" of psychometric excellence a
preschool tests. It is a well-developed, standardized measu
dler, and preschool development, and it provides valuable in
patterns of early mental development. The BSID-II has ex
and validity. It is normed for children from 1 month to 42

The BSID-II consists of three scales: Mental Scale, M
Behavior Rating Scale (BRS). The Mental Scale includes 17
by incremental months that assess the full range of early cogn
include: habituation, sustained attention, memory, manipu
shape discrimination, imitation, generalization, classification
prehension, problem solving, early number concepts, prewr
perception, perceptual motor integration, vocalization, la
objects, and social skills. The Motor Scale includes 111 it
incremental months that assess the full range of control of t
muscle groups. These include the child's muscle tone, dy
balance, prewalking, prewriting, sensory integration skills
motor development. The BRS is a Likert-type 5-point ratin
sures the qualitative aspects of the child's test session behavio
of behavior assessed include: motor quality, attention/ar
regulation, orientation, motivation, and engagement with pe

Administration of the BSID-II requires considerable pr
rience. While the test examiner must adhere to the standard
istration directions, the test is designed to be flexible in or
child's optimal performance. Test items consist of child-
activities with durable, engaging materials. In addition, so
trations allow the caregiver to aid the examiner in elici
response from the child. For children under 1 year of age,

verted from raw scores; each standard score has a mean of
15. Scaled scores range from 50 to 150. Qualitative classif
and PDI score ranges are as follows: accelerated perfor
above), within normal limits (85–114), mildly delayed perfo
and significantly delayed performance (69 and below). Typi
the score used to determine if a child is presenting with a dev
or cognitive deficit. The test also incorporates facet scores t
opmental strengths and weaknesses in the domains of cog
social, and motor performance.

At nearly every age, the full range of scores is available. At
level, a raw score of 0 converts to an index scale score of 5
Scale and an index scale score 54 on the Motor Scale. Co
42-month age level, a raw score of 178 converts to an index s
on the Mental Scale and an index scale score of 125 on the M
at this most extreme age, the available index score range is
SD above the mean, which allows a sufficient ceiling to discri
but the most extreme high ability in $3\frac{1}{2}$-year olds (Bayley, 1

In addition, for each 1-month interval, the raw score corr
index score of 100 represents the median performance for tha
Consequently, the examiner can derive an approximate de
equivalent (mental as well as motor) from a raw score even
does not fall within the BSID-II's age norms. This is par
when an examiner needs to assess an older child or adolesc
opmental functioning is quite low and who cannot be as
standardized cognitive measures that meet age norms for
chronological age. An example of the BSID-II being used i
of an older teen with developmental challenges, along with
reporting BSID-II scores, and a qualitative description of
the use of this test, in this particular situation, are described

It should be noted that the BSID-II has specified age item
Mental Scale and the Motor Scale, and basal and ceiling ru
scales that differ from the original BSID. As a result, there
controversy surrounding the BSID-II regarding whether to

the child's developmental profile can be ascertained. Often mation can be quite valuable with regard to diagnostic clari developing an outline for educational programming and services.

The BRS was scaled with a percentile rank by age met standard score. The rationale for this was that the primar BRS was to determine whether the child's behavior fell limits," was "questionable," or "nonoptimal." For this pur rank scoring system was deemed to be more appropriate.

B. Bayley Scales of Infant and Toddler Development, Third Edition

The Bayley Scales of Infant and Toddler Developmen (BSID-III) (Bayley, 2005) is the third iteration of the (Bayley, 1969), and has been released to the market.

The BSID-III very closely resembles the BSID-II with additions and publisher-reported improvements. For the cognitive, language, and motor scales of the BSID-III re from the BSID-II (although some minor modification in so and test items has been made). Noted additions to the BS social-emotional subtest, an adaptive behavior subtest, gr growth charts, a screening test, a structured caregiver repo assistant. The test publisher's reported improvements in th the previous edition of the test include: easier administratio and ceiling, additional clinical validity studies, new norms, s rules, and option for increased caretaker input. To date, the published reviews completed on this newest revision of th quently, as of this writing, it is difficult to make comparis BSID-II and BSID-III with regard to test administrati interpretation, and draw conclusions with regard to pre utility, particularly as it relates to assessment for menta the very young.

weaknesses for the purpose of refined diagnosis and treatm

The DAS score that is used to determine eligibility for a dia retardation is the General Composite Ability, or GCA score the DAS provide a detailed description in their manual of wh the term IQ, which relates to ongoing controversy surroundi intelligence. Regardless of this, the GCA has a high degr validity with other major tests of cognitive ability, such as the and, therefore, may be considered to be an appropriate too a diagnosis of mental retardation. Similar to most other me tive ability, the DAS GCA has a mean of 100 and a SD of the highest of three levels of measurement in the DAS. Dire GCA are cluster scores for various domains of functioni individual subtest scores.

The DAS is different than some other measures of cogniti subset scores are not given equal weight in the determinati composite measure (GCA) of abilities. Only subtests that loa included, where *g* is defined as "the general ability of an indiv complex mental processing that involves conceptualization a mation of information" (Elliot, 1990, p. 12). Other subtests a battery in order to provide important diagnostic and treatm For example, memory subtests included in the battery were useful diagnostic information while not loading highly on *g*.

The authors of the DAS used exploratory factor anal determine the most appropriate way to conceptualize abilit levels. This resulted in a developmental differentiation in cluster scores that are identified at different age levels. Bet 2 years, 6 months and 3 years, 5 months, exploratory factor a a single factor model; thus, the DAS provides only the GCA s Between the ages of 3 years, 6 months and 5 years, 11 mon factor analyses revealed a two-factor structure. At this age provides the Verbal Ability and Nonverbal Ability Clusters. children, ages 6 years, 0 months to 17 years, 11 months, th

Preschool Core and the School-Age Core. The Preschool Core
Building, Verbal Comprehension, Picture Similarities, Nam
Pattern Construction, Early Number Concepts, and Copy
Age Core consists of Recall of Designs, Word Definitions, F
tion, Matrices, Similarities, and Sequential and Quantitati
addition to the core subtests, Diagnostic Subtests are inc
Letter-Like Forms, Recall of Digits, Recall of Objects–
Delayed, Recognition of Pictures, and Speed of Information
examiner's manual provides detailed information about each
and respective age ranges, as well as a list of factors which m
lower scores on a particular test (e.g., attention ability, compl

The DAS is a well-standardized measure of cognitive abili
adolescents. In addition to excellent standardization, the
validity and reliability. Statistically and theoretically sour
used in creating GCA scores such that only subtests with h
included, while subtests that do not load highly on *g* were sti
purpose of refined diagnosis and treatment planning. Fur
been these authors' experience that children, especially y
seem to be highly engaged by the materials of the DAS. A
of this and other attributes, the DAS may sometimes seem ea
than some other cognitive tests, particularly to lower functi

The DAS manual provides information on a small sa
($n = 25$) previously and independently identified as being "e
retarded" (Elliot, 1990, p. 257). Similar to the performance
mental retardation on other tests of cognitive ability, child
retardation obtained generally depressed scores. These chi
mean GCA score of 59.4, a mean Verbal Ability score
Nonverbal Reasoning Ability score of 63.4, and a Spatial
65.8. Scores on Diagnostic Subtests were similarly uniforml

The DAS manual does not provide information on the
children who are considered to be in the severe to profound
retardation. Furthermore, the DAS was not standardized
tioning below this level. The appropriate lower limit of th

nating between ability levels for children performing in t
of cognitive functioning. This is critical for treatment plann
cognitive ability over time.

D. McCarthy Scales of Children's Abilities

The McCarthy Scales of Children's Abilities (McCart
individually administered test of cognitive abilities for your
$2\frac{1}{2}$ to $8\frac{1}{2}$ years. It is a well-standardized and psychometrica
ment (Sattler, 1992). The McCarthy provides a general lev
functioning and an assessment of a child's cognitive functior
verbal ability (to understand, process, and express verb
nonverbal reasoning ability (visual-motor coordination and
tical reasoning abilities), number aptitude (understanding o
ber concepts, and counting), short-term memory (auditory
motor functioning (fine and gross motor, and hand domina

Specifically, the McCarthy contains the following five scal
Perceptual Performance Scale, Quantitative Scale, Mem
Motor Scale. The McCarthy comprises 18 different tests w
the five scales. There are five verbal tests, seven perceptual pe
three quantitative tests, four memory tests, and five motor
tests fall into two of the five scales. For example, drawing v
shapes is considered both a motor task and a perceptual pe

The various test items involve puzzles, toy-like material
tasks. Most children and examiners find the procedures extr
Tests are arranged in an order which facilitates obtaining a
functioning. Test rapport is facilitated by having several
precede initial items requiring verbalization on the part of th
these initial verbalizations are of a one-word nature which
dren overcome any initial anxiety associated with talking
person. In addition, the test has incorporated into it a "buil
possible fatigue. Halfway through the test, the child is asked
a variety of gross motor task items (e.g., beanbag throw

potential anxiety and frustration, and add to the test's a
children.

All test items are scored according to standard procedure
testing manual. The manual is laid out well, and is clear t
testing time ranges from 45 to 60 min.

Once all the tests have been administered, standard scores
can be calculated. Each of the five scales has a mean of 50
In addition, an overall General Cognitive Index (GCI) score
is based on the sum of the Verbal Scale score, the Percept
Scale score, and the Quantitative Scale score. The GCI has a
a SD of 16. Specifically, the functional definition of the GCI
the child's ability to integrate accumulated knowledge and a
edge in order to perform the tasks on the scales (Sattler,
McCarthy deliberately avoided calling the GCI an IQ score
bles an IQ, conceptually and statistically (McCarthy, 1972)
descriptive classifications associated with the GCI are alm
those used for IQ on the various Wechsler scales. Further, t
mental ages for the GCI can serve as indications of mental

Nevertheless, it has been reported that psychometrically
scores are not the same. Specifically, with regard to con
differences were reported between the McCarthy and th
Form L-M (Terman & Merrill, 1960), Wechsler Intell
Children-Revised (WISC-R) (Wechsler, 1974), and Wechsl
Primary Scale of Intelligence (WPPSI) (Wechsler, 1967)
of gifted preschool children (Gerken, Hancock, & Wade
with mental retardation (Levenson & Zino, 1979), childre
disabilities (Goh & Youngquist, 1979), and preschool c
Pasewark, & Tindall, 1978), respectively. For gifted presch
differed by 10 points with the mean GCI being significantly l
derived using the Stanford-Binet: Form L-M. For child
retardation, McCarthy GCIs were, on the average, 20 poin
Stanford-Binet: Form L-M IQs (44 vs 64). For childre
disabilities, GCIs were, on average, lower than WISC-R IQ

sionals for evaluating cognitive functioning in young child
for children in the $2\frac{1}{2}$ to 4 year range. Prior to their first revis
Bayley Scales of Infant Development (BSID) (Bayley, 1969
dardized for infants and toddlers in the 2 month through
and the original WPPSI (Wechsler, 1967) was only standard
in the 4 to $6\frac{1}{2}$ year range. The WPPSI's companion WISC-R
covered the age range of 6 years to 16 years, 11 months; th
overlapped with the WPPSI in the age range of 6 years to 6
Consequently, during that time period, professionals frequen
McCarthy as a preferred cognitive assessment for evaluatin
in the toddler and preschool age since it covered this $2\frac{1}{2}$ to
gap. It also was appealing as the instrument made use of
materials and most young children (and examiners) found th
quite enjoyable. Further, some evaluators actually preferre
for evaluating children in this entire $2\frac{1}{2}$ to $8\frac{1}{2}$ age range si
switching across three instruments (i.e., McCarthy, WPPS
when conducting multiple reevaluations of the same child ac
year age period.

When the WPPSI was first revised in 1989 and becam
(Wechsler, 1989), its age range was expanded by decreasi
upper age limits; it then covered the age range of 3 years to 7
When the BSID was first revised in 1993 and became the I
1993), its age range also was expanded by increasing its up
then covered the age range of 2–42 months. Thus, these first
well-known tests created a seamless continuity in age covera
the cognitive functioning of children ages 2 months to 7 yea

Since that time, there appears to have become less
McCarthy as a preferred cognitive instrument. However, cle
more a result of being "squeezed out" by other well-known
than any formal displeasure with the test. Indeed, as the M
production of a profile of functioning with age equivalents,
continue to rely on the McCarthy as a cognitive measure
situations. These include: when examinees are not resp

ing McCarthy scores and qualitative description of perform
are described in Exhibit 2.2.

E. Stanford-Binet Intelligence Scales, Fifth Edition

The Stanford-Binet Intelligence Scales, Fifth Edition (SB
is the latest version of one of the classic and most respe
designed to assess intelligence. The original version of th
scales was created almost 100 years ago. The SB5 was publis
project. It is the long-awaited update of its predecessor, th
Intelligence Scales, Fourth Edition (SB4) (Thorndike, H
1986), which was met with some disappointment by evalua
introduced. The dissatisfaction with the SB4 was large
appearance and structural changes from its predecessors (i
point scale for all subtests rather than use of developmental
increase in the number of subtests, to name just a few) w
useful in the evaluation of the very young, the developmenta
the mentally retarded (together, a large population market c
editions of the Stanford-Binet scales had been used).

Overall, the SB4 more closely resembled Wechsler scale
structure, and data output than previous editions of th
scales. As a result, since the SB4 came to the market in
Stanford-Binet appeared to wane. The SB5 revived mar
features considered strengths in pre-SB4 editions, includin
children, functional age levels, and expanded ranges of sc
high-functioning examinees. Consequently, with the introdu
there appears to be renewed enthusiasm for this well-establ
and a resurgence of use by evaluators. Indeed, these authors
to be a preferred instrument for assessing individuals who
(gifted) or very low (mental retardation) levels of functioni
the SB5 is an ideal choice for assessing the lower limits of m
as the SB5 measures IQ down to 10 and up to 225 (v
Extended IQ).

functioning that has been investigated empirically over
(D'Amato, Fletcher-Janzen, & Reynolds, 2005). The SB5 p
two domain scores [Nonverbal IQ (NVIQ) and Verbal IQ
factor indexes (Fluid Reasoning, Knowledge, Quantita
Visual-Spatial Processing, and Working Memory). These fi
SB5 were selected based on research on school achievemer
ratings based on the importance of these factors in th
reasoning, especially in giftedness assessment. Further, the
was shifted from an emphasis on short-term memory only,
an emphasis on Working Memory. Overall, the SB5 is base
cal cognitive model (*g* model) with five factors emphasizing
ities that can be administered within a 45- to 75-min period

Each of the five factors is considered using both verbal and
sures. The SB5 is the first intellectual battery to do this. Thu
subtests, including two special routing subtests. These 10 subte
Fluid Reasoning: Object Series/Matrices (a routing subtest); *N*
edge: Procedural Knowledge and Picture Absurdities; *Nonve*
Reasoning: Nonverbal Quantitative Reasoning Items; *Nonverb*
Reasoning: Form Board and Form Patterns; *Nonverbal* W
Delayed Response and Block Span; *Verbal* Fluid Reasoning:
items, Verbal Absurdities, and Verbal Analogies; *Verbal* Kno
lary (a routing subtest); *Verbal* Quantitative Reasoning: Ver
Reasoning items; *Verbal* Visual-Spatial Reasoning: Positio
items; and *Verbal* Working Memory: Memory for Sentences a

The mean of the composite score (FSIQ), two domain sc
VIQ), and five factor index scores is 100 with a SD of 15
editions which had a mean of 100 and a SD of 16). The FS
measure of cognitive ability. The FSIQ is obtained via the a
the 10 subtests. The NVIQ is obtained via administration of
bal subtests. Similarly, the VIQ is obtained via administr
verbal subtests. Ten profile scores, called scaled scores, als
from each of the five nonverbal and five verbal subtests. T
range from 1 to 19 with a mean of 10 and a SD of 3. Th

and straightforward to score. Examiner directions are print
examiner's pages of three easel item books. Item Book 1 con
subtests, Item Book 2 contains the nonverbal levels, and I
tains the verbal levels. The SB5 record form is designed in a
that of other intelligence batteries, and is straightforwa
A plastic tray for toys and manipulative pieces is provided
facilitate the flow of materials during test administration.

The examiner begins the standard test administration b
routing subtests in Item Book 1: *Nonverbal* Fluid Reasonin
Matrices, and *Verbal* Knowledge—Vocabulary. Estimates
ability on the nonverbal and verbal domains are obtain
scores on each of these two routing tests. These scores
remaining assessment to the individual's functioning abili
uses simple conversion tables to determine on which
(ranging from easy to hard, Levels 1 through 6) of the nonv
scales to begin and continue testing.

The examiner continues on in Item Book 2 and then Ite
standard order of administration. The SB5 makes use of test
three to six items that are placed within each of the functio
Book 2 and Item Book 3. Within each testlet, items are orga
increasing difficulty. The mixture of tasks (easy to challeng
testlet appears to promote greater interest and attention
during the testing process than the traditional point-scale
tests. Each functional level has four testlets. There are six
tional levels (labeled Levels 1–6) and five verbal function
Levels 2–6).

This two-stage testing procedure (with routing subtests a
followed by functional level sections next) provides very pr
cognitive ability in a relatively short period of time. On aver
take 15–75 min to administer, depending on which scales a
the items on the SB5 are not timed and time bonuses are
estimated time to acquire a FSIQ is 45–75 min. If necessary,
challenging individuals, administration of the complete tes

individuals with autism, communication disorders, hearin
limited English-language skill, and other considerations when
verbal ability is deemed to be limited.

The psychometric properties of the SB5 are considered to
Extensive reliability, validity, and fairness studies were cond
the impressive SB5 standardization process. High marks from
been given to the instrument in all areas. In addition, subj
from officially documented groups, including individuals w
dation, learning disabilities, attentional deficits, and spe
impairments. Expected results for these groups were found
(Roid, 2003b).

The SB5 provides the option for computerized scoring w
extended score report and a brief, narrative summary report. T
scoring program is purchased separately from the test kit.

F. The Wechsler Scales

Currently, the Wechsler scales are the most widely used in
nistered tests of intelligence in the United States (Kaufman &
1999; Prifitera, Saklofske, Weiss, & Rolfhus, 2005). The
gence tests include the Wechsler Preschool and Primary Scal
Third Edition (WPPSI-III) (Wechsler, 2003a), the Wech
Scale for Children, Fourth Edition (WISC-IV) (Wechsler
Wechsler Adult Intelligence Scale, Third Edition (WAIS
1997). All of the Wechsler tests have been well standardi
excellent reliability and validity. The Wechsler scales are ofte
among examiners who receive a referral for an individual hav
of having mental retardation.

The first Wechsler test, the Wechsler-Bellevue (WB) (Wec
created by David Wechsler at Bellevue Hospital. The WB
improvement over many earlier tests of intelligence in its m
of administration and interpretation. In addition, the WB w
Verbal and Performance subtests, which ultimately led to ne

The WPPSI-III is an appropriate measure of intelligence
2 years, 6 months to 7 years, 3 months and is often the first
the determination of intellectual functioning in a preschool
the third iteration of preschool tests of intelligence from the
Similar to previous tests, the WPPSI-III provides a ger
intelligence, the FSIQ, which is appropriate for use in deter
sis of mental retardation. The WPPSI-III also provides s
scores which may provide useful information in diagnosis a

For children between the ages of 4 years, 0 months and 7
the WPPSI-III provides a FSIQ, Verbal IQ (VIQ), Performar
Processing Speed Quotient (PSQ). For children 2 years, 6
7 years, 3 months, the WPPSI-III also provides useful me
word receptive and expressive vocabulary which form a G
Composite (GLC). See Table III for a brief description of eac
subtests.

Detailed information on scoring and interpretation of
provided in the manual as well as in alternative sources (
Kaufman, 2004). Like other Wechsler IQ tests, the WPPSI-
types of scores: raw, scaled, and standard. The raw score i
total of points earned on a subtest. This raw score is conve
score, which is a norm-referenced score with a mean of 1
generally ranging from 1 to 19 (Lichtenberger & Kaufman,
scores are then derived from the scaled scores and have a
a SD of 15.

For a child between the ages of 6 years, 0 months and 7
the clinician has the choice of using either the WPPSI-III
both of these tests can be used in this age range. Genera
WPPSI-III would be used for children suspected of having
tive functioning, while the WISC-IV would be reserved fo
suspected of having average to above average intelligence. I
that the WPPSI-III is not generally considered to be an
measure for children suspected of functioning in the sev

Block Design[a,b,c]	Visual-spatial analytic and synthetic r ability, speed of mental processing
Picture Concepts[a,b]	Visual inductive reasoning
Matrix Reasoning[a,b]	Visual-spatial reasoning ability, percep
Digit Span[b,c]	Short-term auditory working memory concentration
Letter-Number Sequencing[a,b,c]	Short-term auditory working memory concentration, verbal comprehension
Arithmetic[b,c]	Short-term auditory working memory concentration, numerical reasoning, lo
Coding/Digit Symbol Coding[a,b,c]	Visual-perception, speed of mental pro coordination, visual-motor processing concentration, short-term visual recall
Symbol Search[a,b,c]	Visual-perceptual discrimination, spee processing, visual-motor processing sp concentration, short-term visual recall
Cancellation[b]	Attention to detail, sustained attentio perceptual ability, perceptual organiza

[a]WPPSI-III.
[b]WISC-IV.
[c]WAIS-III.

ranges of mental retardation, as it cannot provide inform strengths and weaknesses in this range of functioning. A re adaptive behavior ratings along with the medical and dev tories will be helpful in determining whether the WPPSI-III

Furthermore, at early ages, it may be difficult to obtai children functioning in the moderate range of mental retard potential for a high number of raw scores of zero which wou measure. It is important to remember that although raw scor validly converted to scaled scores, valid IQs can only be ob has earned a specific number of nonzero subtest raw sc 2003a). The specific number of nonzero subtests required f and index scores is provided in the test manual.

to substitute the Symbol Search subtest for Coding. The
detailed information on the number of subtests that must be
prorate for each age range, as well as valid test substitutions. T
whenever possible, should be decided on prior to test admini
the possibility (or temptation) of substituting or prorating tes
a child performed better on one test than on another.

The publishers of the WPPSI-III provided data from cl
children with mental retardation in order to improve the
interpretation of test scores in this population. Consistent w
Wechsler Intelligence Scale for Children, Third Edi
(Wechsler, 1991) and WISC-IV (Wechsler, 2003b), scores
clinical sample of individuals with mental retardation were
attenuated on the WPPSI-III, showing no consistent pat
troughs in score profiles. VIQ and PIQ also showed little
discrepancy (Wechsler, 2003a). However, children in the m
mental retardation range consistently demonstrated a nonsi
strength in Similarities. The mean FSIQ for children w
retardation in the clinical sample provided in the WPPSI
62.1; for moderate mental retardation it was 53.1 (Wechsle

H. Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV)

The WISC-IV is the fourth iteration of the Wechsler Inte
Children (WISC) (Wechsler, 1949). It was designed to measu
functioning of children and adolescents from 6 to 16 years o
Wechsler tests, the WISC-IV is appropriate for assessing inte
duals in the moderate range of mental retardation and a
designed to provide an accurate estimation of functioning
the severe and profound ranges of mental retardation and,
not be used.

The WISC-IV is composed of 15 subtests, 10 of which ma
core, and 5 of which compose the supplemental tests. The su
are used to provide additional clinical information, as well a

four index scores: Verbal Comprehension (VCI); Percep
(PRI); Working Memory (WMI); and Processing Speed (P
composed of subtests measuring a variety of different cons
verbal domain, including verbal reasoning, expressive vo
comprehension, and long-term memory. The PRI includes
ing various aspects of visual-spatial reasoning ability, and in
motor dependent and motor independent measures. The
measures of short-term auditory working memory. The PS
sures of speed of mental processing which are generally cons
motor dependent. The manual provides detailed informatio
interpretation, as well as specific rules for prorated scores a
See Table III for a brief description of each of the subtests.

Like the WPPSI-III, the WISC-IV was standardized on a
tative sample of the population, and has established excelle
validity (Wechsler, 2003b). Included in the manual are
individuals within the mentally retarded range of intellect
On the WISC-IV, children with mild mental retardation
FSIQ score of 60.5, while children with moderate mental reta
a mean FSIQ score of 46.4. Children with mental retardation
generally uniform depression in index scores, with no eviden
significant differences between them.

I. Wechsler Adult Intelligence Scale, Third Edition (WAI

The WAIS-III (Wechsler, 1997) represents the latest editio
Adult Intelligence Scale, a measure that originated in 1939 w
Bellevue Intelligence Scale—Form 1 (Sattler, 2001). The
appropriate measure to use when assessing the intelligenc
from 16 to 89 years of age. The FSIQ scores on the WAIS-I
to 155. Thus, this test is appropriate for measuring IQ in i
moderately mentally retarded and higher ranges of function
noted that the WISC-IV and the WAIS-III overlap at age 16.

tests, in that they generally occur after the examinee has
number of items or reached a designated time limit. Tes
times vary, and estimates given in the manual are not likely
to those seen in individuals with mental retardation. In s
individuals will take significantly less time than average, du
ceilings quickly. In other cases, examinees will take a sig
amount of time, due to difficulties with processing speed,
ability, fatigue, and other factors.

Similar to the other newer tests in the Wechsler series, t
revised from previous versions to provide better alignm
theories of intelligence (Zhu, Weiss, Prifitera, & Coalson, 2
greater emphasis on abstract and fluid reasoning, and bette
factor analytic studies suggesting the need for an expansion
VIQ/PIQ division (Psychological Corporation, 2002a). Th
sists of 14 subtests, 11 of which are required in order to c
In addition to the FSIQ, a VIQ and PIQ are obtainable. T
provides four index scores, aligned with factor analyti
Perceptual Organization (POI); WMI; and PSI. These index
gous to VIQ, PIQ, WMI, and PSQ of the WPPSI-III, respect
the VIQ, the VCI is considered to be a more refined m
comprehension ability, due to the fact that measures of w
are now a part of a separate domain (WMI). POI is likewise c
more refined measure of visual-spatial and perceptual reason
processing speed measures have been teased out and facto
score (Psychological Corporation, 2002a).

A large body of empirical data supporting the reliability a
Wechsler scales has been collected. The technical manual p
information relating to this quality of the WAIS-III. In sup
tation, the manual reports that the WAIS-III was standard
matched to 1995 census data with regard to race, ethnici
educational attainment, and geographic region. In additio
was reportedly divided into 13 age groups for standard

FSIQ score of 58.3, a mean VIQ score of 60.1, and a mean P
Mean index scores in this sample were as follows: VCI = 6
and PSI = 63.3. For individuals with moderate mental retar
FSIQ score was 50.9, while the mean VIQ and PIQ scores we
respectively. Mean index scores for individuals with moder
dation were as follows: VCI = 56.8; POI = 58.9; and PS
scores were not obtained, as individuals were not given the
Sequencing subtest, a necessary component of this index sc
mean scores were found in Arithmetic in both populations, a
tions scored relatively poorly on Symbol Search. However,
been found in studies with children with mental retardation,
sample provided did not receive a relatively higher PSI scor

IX. NONVERBAL INTELLIGENCE TESTS FREQUEN TO ASSESS FOR MENTAL RETARDATION

A. Leiter International Performance Scale

The Leiter International Performance Scale (Leiter, 1948
preeminent, individually administered, nonverbal, standard
test. Despite some test limitations reported by Sattler (1992)
preferred nonverbal instrument used in the field until a revision
Leiter International Performance Scale-Revised (Leiter-R)
1997) came to the market. However, this original instrum
have merit (particularly in evaluating for mental retardation
and adolescents) and be worthy of discussion despite the gen
Ethical Standard 9.08 in the American Psychological Associati
(American Psychological Association, 2002) regarding use of

The original Leiter and the Leiter-R are quite different i
regard to test materials and the mechanics by which the exa
tasks. While the Leiter-R requires the examinee to engage

learns what is expected in terms of performance. In this
repeatedly experienced in our clinical practice that, for ex
these, frustration with the Leiter-R can ensue because of th
and that our examinees require repeated "learning" perio
just give up. Yet, these same examinees persist in an unintern
the original Leiter. Thus, we have retained the original Leite
ry of standardized IQ test materials, and encourage evalu
this instrument if the Leiter-R proves less than successful.

The original Leiter International Performance Scale (I
nonverbal test of intelligence for individuals, 2–18 years of
most frequently used to evaluate the non-English speak
disadvantaged, and those with hearing or speech deficits
language handicaps, motor deficits (including cerebral pa
problems. It also has proved quite useful in the evaluatio
with autism and/or mental retardation. A history of the
instrument (including preparatory work, revisions, and ada
found in Gabel, Oster, and Butnik (1986) and Sattler (1992

The original Leiter requires an examinee to mat
corresponding strips positioned on a slotted, wooden fram
standardized subtests divided into three trays of blocks a
covers years 2 through 7, Tray 2 covers years 8 through 12, a
years 13 through 17. This Binet-type years-scale has four
year level from year 2 through year 16, and six tests at year 1
measured are: Concretistics (matching of specific relation
Transformations (judging relationships between two events),
criminations, Spatial Imagery, Genus Matching, Progressive
and Immediate Recall.

Instructions to the examinee are given in pantomime by e
the materials in a specific fashion or completing a portion
demonstrate the problem-solving strategy. Examinees are
considerably below their chronological age which allows
understand the general problem-solving expectation of this
no time limits to this scale except on three separate subtest

on the Leiter is used to obtain an IQ by the ratio method (
100) (mean = 100, SD = 16). It was later recommended that
points be added to this IQ equation because the original no
underestimate children's intelligence (Leiter, 1959). A thorou
General Instructions for the Leiter International Performan
1969) is vital as there are some scoring peculiarities to th
scoring adjustment is made to the examinee's mental age,
additional scoring caveat once the examinee reaches chrono

The format for reporting Leiter scores and qualitativ
performance on this test is described in Exhibit 2.2.

B. Leiter International Performance Scale-Revised

The Leiter International Performance Scale-Revised (Le
Miller, 1997) is the long-awaited update to the Leiter Inter
mance Scale (Leiter, 1948). This individually administered,
dardized intelligence test assesses the cognitive functioning
2 years, 0 months to 20 years, 11 months. Like the original Le
was developed to be used with individuals who could not
validly assessed with traditional intelligence tests. Specifica
duals include those with communication disorders, heari
motor impairments, cognitive delay, traumatic brain injury,
disorder, types of learning disabilities, and English as a seco

The Leiter-R emphasizes fluid intelligence. Thus, the test
that the derived IQ is not significantly influenced by the lev
the individual's educational, social, and family experienc
measures the IQ range of 30–170. Thus, it would be an app
assessing those individuals falling in the mild to severe
retardation.

The Leiter-R consists of 20 subtests organized into
Reasoning, Visualization, Memory, and Attention. The 10
Visualization subtests assess visualization, reasoning, and
Together, these subtests make up the Visualization and

provide an estimate of global nonverbal intellectual level. Th
score that a cognitive deficit could be determined, and, in
deficit scores in adaptive functioning, a diagnosis of mental
be made. The examiner also has the option of administering
Batteries together. This may provide information regarding a
of cognitive-processing deficits in memory or attention on th
ation of global intellectual ability. For example, if a child
dificit disorder is highly distractible or presents with severe se
deficits, the AM Battery could provide evidence to "rule
diagnosis of borderline intelligence or deficit cognitive funct

In addition to a traditional composite IQ (with a mean
15), the Leiter-R provides subtest scale scores (with a mean o
percentile scores, and age equivalence scores. The latter sc
understood by parents and others with whom the test result

The Leiter-R also has four rating scales (Examiner, Parent, S
which offers multidimensional behavioral observation infor
individual. In addition, the Leiter-R provides Growth Sc
assessment of individuals with severe handicaps. Specifica
enable professionals who reevaluate the cognitive develop
and adolescents with severe mental retardation to measu
important, improvement in their cognitive skills. Thus, th
improvement across time can be ascertained (regardless of a
as well as ascertaining the likely efficacy of current educatio
programs and areas where modification(s) in programming n

For the Leiter-R, the test developers reduced the ph
the original Leiter kit and provided improved hygienic testi
original Leiter wooden blocks have been replaced by colorful
cards, and foam rubber manipulatives. Test materials also i
card stimulus easel books that include examiner directi
materials.

Neither the examiner nor examinee is required to spea
does not need to read or write, either. The Leiter-R require
place the cards and manipulatives into "slots" in the "

subgroups of atypical children and adolescents (including 1
nosed with mental retardation). The Leiter-R mean comp
individuals in the cognitive delay (mental retardation) clinic
62.7 and 55.4 for the 2–5 age group and 6–20 age group, respec
and validity are extensively described in the test manua
correlates .85 with the WISC-III FSIQ and .85 with the origina

In addition to being a measure which can provide ability
tive to small increments of improvement in cognitive ability,
be a useful, nonverbal alternative for early identification of
(2 years, 0 months up to 5 years). It also can be a useful, nc
tive for the assessment of cognitive functioning in individ
mental retardation when a professional team is charged w
transitional services from school to postschool activities (t
when a child is between 14 and 16 years).

X. SPECIAL CONSIDERATIONS IN TEST ADMINIS FOR CHILDREN WITH MENTAL RETARDATI

Cognitive testing is a skill that requires advanced trainin
practice (Sattler, 2001). This is especially true with regard
dren. In order to obtain an optimal performance from a ch
must possess flexibility, creativity, patience, attentiveness,
tremendous affinity for children. Children with mental retar
ent even greater challenges to the test administrator, presen
deficits that may reduce the likelihood of obtaining an indivi
performance level. In order to obtain the most accurate asses
functioning level, the examiner must be extremely vigilant ar
factors. This generally requires a great deal of skill and pr
part of the examiner. In particular, it is helpful to become fa
common problems and solutions associated with assessing
These difficulties include problems with attention and focu
mood, fatigue, motivation, anxiety, rapport, and communic

to their state, requiring the examiner to be vigilant to s
changes. In attempting to obtain the maximum performan
a child's attention, it is important to provide multiple break
cues for attention and focus, and provide frequent feedbac
the form of "I like how hard you're trying."). Finally, if
takes a prescription medicine to assist with attention, this m
used during an assessment of cognitive ability.

Signs of fatigue may manifest in a number of different w
signs of fatigue in children with mental retardation may inc
such as yawning, slurring of speech, drooping of eyelids, slo
ments, resting of the head in the hands, putting the head do
irritable. However, children with mental retardation also m
fatigue by becoming suddenly oppositional, requesting to lea
bathroom, starting to cry, becoming restless, or resorting to s
"I don't know" answers or nonresponses. At times, cognitiv
related to the specific cognitive demands of a subtest. For
with language difficulties may appear exhausted when respon
ended verbal query, but may "perk up" after moving on to
visual, such as a matrix-reasoning test. In this case, simpl
different test modality can help to ameliorate fatiguing. How
with slow processing speed or limited working memory cap
sistently demonstrate fatigue as the cognitive load of th
regardless of the ability being taxed. A child's cognitive and
limitations will require the examiner to be much more vigil
level of fatigue. Rarely will a child with cognitive limitations
for a break, yet a lack of appropriate accommodation could
down," in which the child no longer is able to function a
capacity. For this reason, the examiner should maintain an
child's cues that he or she is having difficulty, providing br
activities when possible. Often, it may be helpful to allow th
small amount of a drink, a snack, or a walk down the hall
particularly intractable, it may be necessary to administer th
sessions. It also is important to remember that, for some

administration (Johnson, Bradley-Johnson, McCarthy, & Jan
stickers, pencils, or small pieces of cookies or crackers as a re
on task and working hard is an effective practice. However, it
reinforcement is provided in a manner that does not break
protocol of the test being administered. Obviously, reinfo
be given for effort, not correctness. Furthermore, it is critic
approval of the child's parents or caregiver when providing
This is particularly true with food, as children with mental
have food restrictions due to allergies, metabolic issues,
chewing and swallowing, and/or cultural/religious beliefs.

Communication problems and anxiety may negatively a
mance in cognitive assessments (Lezak et al., 2004). In
mental retardation, it may be particularly challenging to e
and decrease anxiety. Many children with mental retardat
speech and language delays, and may not always find com
words (Spruill, Oakland, & Harrison, 2005). They also may b
and frustrated by the verbal messages presented to them. Su
use alternative means of negotiating and understanding th
For example, they may read a person's face and tone before
words spoken. For this reason, children with mental retardat
particularly anxious when working with an examiner who
vacant and expressionless during test administration. Indivi
tive deficits may tend to interpret this behavior as an indi
have done something wrong (Lezak et al., 2004). Therefo
must endeavor to communicate messages of warmth, posit
forcement, comfort, patience, and a sense of fun through the
and affect. In addition, young children, who may be wary o
need a transition object available to help them adjust to the
young children or children who are particularly anxious, hav
the testing room may be the only means of ensuring an optim
In this case, the parent always should be behind the child so
not distracted and does not look to the parent for testing c
also should be instructed not to help or encourage the child

(2005).

A. Test-Specific Considerations

Specific tests of intellectual functioning also may present u
in test interpretation when assessing individuals with me
A few of these challenges are reviewed below.

1. THE WECHSLER SCALES

Overall, the Wechsler scales provide rigorously researcl
valid measures of an individual's intellectual functioning
Wechsler tests have been the preferred tests of intellectu
children since the 1960's, and there are no tests that are
accepted and approved for the purpose of establishing men
children (Prifitera Saklofska, Weiss, & Rolfhus, 2005). I
improvements from previous versions, the instructions on th
still appear to rely heavily on language. This may be a partic
young children with cognitive impairments, who often show
and language. In addition, the paucity of manipulatives on th
make it a bit less appealing to young children than some o
current use. Finally, it is important to remember that the We
not designed to test children functioning below the moderat
retardation (Psychological Corporation, 2002a,b, 2003). In ca
lower ability level is suspected, alternate measures should be

When using a Wechsler test, one practice that should be ta
is that of using alternate starting points. When testing indi
of having significantly subaverage ability, it may be advis
start points that are more reflective of the individual's su
mental age. Thus, the examinee will be more likely to feel
first item presented. Doing so may help to improve rapport
and decrease anxiety and fatigue. On the WAIS-III, age-re
are not given; rather, all individuals begin at the same point
if they do not obtain the requisite number of basal items cor

A concern that arises with the newer Wechsler scales is processing speed measures in the calculation of the FSIQ While the processing speed factor may indeed provide cli inclusion of this time-dependent measure may lead to atten in children with fine motor difficulties, attention deficits, s anxiety, depression, and/or those taking certain medications important, as always, to carefully scrutinize the child's sco all other data presented (Sattler, 2001). It should be not common for a typical child with mental retardation to pr that is significantly lower than other index scores. The c generally the case, wherein the PSI tends to be slightly high VCI and PRI in children (but not adults) with men (Psychological Corporation, 2002a; Spruill et al., 2005; W Zhu et al., 2004). In the event that an attenuated score i Wechsler scales provide alternative means of obtaining a score, such as through a General Abilities Index (GAI), or th of scores (Prifitera, Saklofske, & Weiss, 2005; Psychologic 2002a,b, 2003).

2. THE DAS

The DAS is a well-standardized measure of cognitive ab and adolescents. However, one drawback of the DAS relate mental model employed in test creation. While this model useful information in treatment planning and diagnostic c and may be argued to be a more appropriate way to measu cause problems for longitudinal comparison. The problem child reaches a certain age, constructs such as verbal ability a using the same tasks on the DAS. Consequently, it may be di child's growth in a specific area of development. Although opers contend that the different subtests used at different a similar constructs, there are subtle differences that may be vant in different children. For example, at different age unrelated to the construct being tested are taxed unequally

Given the content of this chapter, these authors would
reporting on the Flynn effect. The Flynn effect is a phenom
via massive data analyses, by James R. Flynn, a politica
University of Otago in New Zealand, and reported on in a
(Flynn, 1984, 1987, 1998, 2005, 2006). Using IQ test data fr
the developed world, Flynn discovered there have been l
from 5 to 25 points in a single generation (Flynn, 1984,
effect is stronger on tests which measure fluid intelligence (in
for on-the-spot reasoning, abstraction, and problem solving
crystallized intelligence (intelligence centered on accumu
such as vocabulary, arithmetic, and general information).
effect has been most dramatic on data analyses using the Ra
Matrices, a test of fluid intelligence. On the Ravens, the Flyn
a gain of 21 points in 30 years (around .7 point gain per yea
been less dramatic but still impressive on data analyses us
scales and the Stanford-Binet series, IQ tests which measure
fluid intelligence. On these tests, the Flynn effect has been
points within 45 years (around .3 point gain per year).

Further, when reviewing Wechsler VIQs and Wechsler
covered a 10- to 20-point increase in the Wechsler PIQs
heavily loaded on fluid abilities) and a 9-point increase in th
(which are more heavily loaded on crystallized abilities) (Fl
In these same studies, when comparing the WISC with
found that individuals tested on the WISC-R had to answe
correctly, or had to answer harder questions, to obtain the
the WISC. At a later point, Flynn (1998) estimated the m
FSIQ scores between the WISC-R and the WISC-III to be 5
1998). From a practical perspective, this means that someon
score of 105 on the WISC-R would, on the average, receive
the WISC-III.

1995; Slate & Saarnio, 1995; Vance, Maddux, Fuller, &
Further, a widely cited study by Kanaya, Scullin, and
provided support that the Flynn effect is impacting IQ score
retarded and borderline ranges. Analyses showed that the
the WISC-R to the WISC-III were actually very close to
estimate of a 5.3-point difference; the Flynn effect fell betw
points in the mild mentally retarded and borderline ranges
the same magnitude that Flynn found in the middle of the
Flynn (2005) has stated that there is overwhelming evidence
are at least as great for individuals' test scores in the low level
as they are with individuals' test scores in the average range

Overall, the findings indicate that as time passes and IQ
people perform increasingly better on an IQ test, raising
several points within a matter of years. Once a test is r
typically happens every 15–20 years, the mean is reset to
test harder and "hiding" the previous gains in IQ scores. Be
effect takes effect immediately on the introduction of a new I
are most valid at the times the norms are released.

Although there is no consensus among professionals as to
are occurring or what the gains actually mean (with possi
including genetics, SES, higher education levels, increased
ability, and increased test sophistication), all are in agreeme
occur and that they hold significant theoretical and pract
In this regard, Neisser (1998) has provided a review of
importance.

Specifically, with regard to the mentally retarded popul
effect raises particular concerns in a number of areas. Firs
(2003) point out that because of the systematic increase in
past 80 years (the Flynn effect), there is reason to believe tha
are diagnosed as mentally retarded based on the year in whic
and test norms used rather than on their cognitive ability
age on various IQ tests, fewer children are diagnosed as m
(in the mild range) as more children's IQs rise above the

than replacing them immediately with newly normed tes
within the same school district, multiple psychologists may
tion services to a district. As a result, different children r
different versions (norms) of the same test in the same scho
nately, in this latter case, these IQ test scores are still co
another, regardless of the fact that different norms were use
are assigned accordingly. Consequently, two children in the
with the same cognitive ability could be diagnosed differentl
different test norms were used for each child.

Overall, Kanaya et al. (2003) indicate that the times t
cautious are when a test is either at the beginning or at the e
cycle, with a test being least valid when administered at the
Needless to say, evaluators always have needed to exercise c
on an IQ to diagnose mental retardation. Knowledge of the
awareness that the effect impacts the lower end of the IQ di
as the average range of the IQ distribution dictates that evalu
for presence of mental retardation seriously consider the F
diagnostic process. Currently, methods to control for the
yet to be formally considered and debated in the liter
Greenspan (2006) has advocated the necessity for evaluato
down with each subsequent year in the norming cycle of a
to control for the Flynn effect. Flynn (2005) and Greens
offered possible formulae to do so.

In addition, some consideration might be given to in
formal time limits by which evaluators must begin using th
of a test once the new version has been formally introduce
place. However, adherence to such regulations likely wou
enforce given the reported budgetary constraints of many sc
mental health agencies. Further, this could provide test publ
encourage premature and unnecessary test revisions. Fina
stance in this matter could prohibit the sometimes necessar
of older editions of some instruments in particular clinica
(e.g., use of the original Leiter as described earlier in this cl

some comments can be made here.

First, because the diagnosis of mental retardation has s
on the child or adolescent's life, the psychologist must be c
rate in reporting test findings. Further, the psychologist mus
presenting all required data consistent with the definitio
making a diagnosis of mental retardation. As described at
this chapter, the diagnosis of mental retardation should neve
on the standardized intelligence test score alone. At mini
should include the documentation of significantly low pe
nationally standardized measure of intelligence and below-
adaptive behavior in a variety of settings. A thorough, pro
ment also should include multiple sources of test information
behavioral observations in school, home, and/or other sett
caregivers, developmental, medical, and social histories, a
sources of evidence.

With regard to the standardized IQ, itself, psychologists
tious when interpreting a low IQ that may reflect condition
intellectual ability. Low scores can be attributed to a variety
alone or in combination. This issue was extensively reviewed
this chapter. Psychologists also must rule out potential co
eses concerning the child or adolescent's test performan
their concerns in the report, before concluding the child
manifesting mental retardation.

However, even if the psychologist provides all this inform
less than adequate report can still result. Indeed, we have
of poor report writing. While the majority of psycholog
"required" information, many psychologists report each
scores and data as separate *and* disparate entities, without
the information into a cohesive, meaningful whole. This leav
gist at risk for not addressing sometimes contradictory in
evaluation (e.g., poor visual-motor integration skill on one t
visual-motor integration performance on another instrumen

positive progression and development. Good report writing
as it is a science.

In addition, if the psychologist is clear that the diagnosi
dation, they should not be fearful to use the term "mental re
written document or during the face-to-face feedback with
takers, and/or school system. In the long run, it does not ser
to skirt the issue. However, it is the responsibility of the
clearly define what mental retardation is and what it is not
other diagnosis being reported) as the parents, caretakers, a
have an incorrect understanding of the diagnostic term(s).

Recommendations contained in the report should be cle
They should be driven by what the child or adolescent need
institution's budgetary restrictions. The report should be co
a fashion so it is readable by parties with varied levels o
familiarity with the tests administered. Finally, the report s
respectfully in all aspects as this document will become pa
adolescent's formal record, will follow the child or adolescer
to come, and may be the foundation for subsequent evaluat
dations, and treatment services with this individual. If infor
child or adolescent's family situation is included in the fo
psychologist always should be truthful but simultaneously
strate respect for the family and exercise discretion in how fa
stated. The parameters of confidentiality must be follow
respect for the family must be maintained.

XIII. SUMMARY

Mental retardation is a categorization for a heterogeneo
viduals with concurrent deficits in intellectual and adap
manifest prior to their 18th birthday. The diagnosis is ma
etiology. Mental retardation is neither a mental disorde

of Infant Development, Second Edition, the Bayley Scale
Toddler Development, Third Edition, the DAS, the McC
Children's Abilities, the WPPSI-III, the WISC-IV, and th
well as, the Stanford-Binet Intelligence Scales, Fifth Ed
original Leiter International Performance Scale, and the Lei
Performance Scale-Revised. The history, conceptual bases
construction, psychometric properties, testing procedures, sc
and examiner qualifications, as well as, indications and cont
the use of each test is reviewed in detail.

Measures of intelligence play a crucial role in the assess
and treatment of children and adolescents with mental ret
gence tests may be administered for a variety of reason
identification of an individual's relative cognitive strengths
are among the most pertinent with respect to customizing
occupational programming. Therefore, it is not good cli
become familiar only with a single standardized test of
make determinations based solely on its findings. Different
various elements of the construct of intelligence. Best pr
require psychologists to become thoroughly familiar with a
intelligence tests in order to ensure that the proper test is sele
findings will be valid and applicable to the individual being
ness of the range of available tests also allows for the option
assessment tools to derive the most accurate information re
vidual's cognitive and adaptive ability. This approach furth
probability that test results will be accurate and contribute
ment of a successful educational program, occupational train
treatment protocol.

There are no shortcuts to competency in terms of test se
tration, scoring, interpretation, and report writing. Adequat
tice, and clinical supervision are the mainstays of competen
intelligence testing when confronted with the complex task
diagnosing mental retardation from a host of similarly app
mental disorders and learning disabilities. Psychologists mus

retardation).

As a final note, it is important for psychologists to be av
effect and its relevance to the diagnosis of mental retardatio
of the Flynn effect is particularly relevant when a psychologi
to testify as an expert witness for the Court and make a diff
of mental retardation as opposed to a learning disabili
disorder. Nowhere will a psychologist's competency invo
testing be more transparent than when it involves educating
fellow professionals (e.g., judges, lawyers, psychiatrists, an
as to the many facts involved in the determination of intell

REFERENCES

American Association on Mental Retardation (AAMR) (2002). *Mental re classification, and systems of support* (10th ed.). Washington, DC: Au

American Psychiatric Association (1952). *Diagnostic and statistical manu* (1st ed.). Washington, DC: Author.

American Psychiatric Association (1968). *Diagnostic and statistical manu* (2nd ed.). Washington, DC: Author.

American Psychiatric Association (1980). *Diagnostic and statistical manu* (3rd ed.). Washington, DC: Author.

American Psychiatric Association (1987). *Diagnostic and statistical manu* (3rd ed., revised). Washington, DC: Author.

American Psychiatric Association (1994). *Diagnostic and statistical manu* (4th ed.). Washington, DC: Author.

American Psychiatric Association (2000). *Diagnostic and statistical manu* (4th ed., text revision). Washington, DC: Author.

American Psychological Association (2002). Ethical principles of psych conduct. *American Psychologist, 57,* 1060–1073.

Bayley, N. (1969). *Bayley Scales of Infant Development: Birth to two yea* The Psychological Corporation.

Bayley, N. (1993). *Bayley Scales of Infant Development* (2nd ed.). San Psychological Corporation.

Bayley, N. (2005). *Bayley Scales of Infant and Toddler Development* The Psychological Corporation.

Early human development (pp. 274–288). London: Oxford University
Elliot, C. D. (1990). *Differential Ability Scales*. San Antonio, TX: The Psych
Field, M. A., & Sanchez, V. A. (1999). *Equal treatment for people with menta and raising children*. Cambridge, MA: Harvard University Press.
Fishler, K., Graliker, B. V., & Koch, R. (1965). The predictability of int Developmental Scales in mentally retarded infants and young children *Mental Deficiency, 69,* 515–525.
Fishman, M. A., & Palkes, H. S. (1974). The validity of psychometric tes congenital malformation of the central nervous system. *Developmenta Neurology, 16,* 180–185.
Flanagan, D. P., & Kaufman, A. S. (2004). *Essentials of WISC-IV assess* John Wiley & Sons.
Flynn, J. R. (1984). The mean IQ of Americans: Massive gains 1932 to *Bulletin, 95,* 29–51.
Flynn, J. R. (1987). Massive IQ gains in 14 nations: What IQ tests really m *Bulletin, 101,* 171–191.
Flynn, J. R. (1998). WAIS-III and WISC-III IQ gains in the United State How to compensate for obsolete norms. *Perceptual and Motor Skills,*
Flynn, J. R. (2005). *Tethering the elephant: Capital cases, IQ and the Flynn* manuscript. Dunedin, New Zealand: University of Otego.
Flynn, J. R. (2006). The Flynn effect: Rethinking intelligence and what af Mendoza & R. Colom (Eds.), *Introduction to the psychology of individ* Alegrel: ArtMeds (English translation from the Portuguese is flynn@stonebow.otago.ac.nz).
Fotheringhan, J. B. (1983). Mental retardation and developmental dela B. A. Bracken (Eds.), *The psycho-educational assessment of* (pp. 207–223). New York, NY: Grune & Stratton.
Gabel, S., Oster, G. D., & Butnik, S. M. (1986). *Understanding psychologic* New York, NY: Plenum Medical Book Company.
Gerken, K. C., Hancock, K. A., & Wade, T. H. (1978). A comparison o intelligence scale and the McCarthy Scales of Children's Abilities wit *Psychology in the Schools, 15,* 468–472.
Goh, D. S., & Youngquist, J. A. (1979). A comparison of the McCarthy Abilities and the WISC-R. *Journal of Learning Disabilities, 12,* 344–3
Greenspan, S. (2006). Issues in the use of the "Flynn effect" to adjust IQ sc MR. *Psychology in Mental Retardation and Developmental Disabilitie*
Grossman, H. J. (1983). *Classification in mental retardation*. Washington, ciation on Mental Deficiency.
Heber, R. (1959). *A manual on terminology and classification in mental reta* Washington, DC: American Association on Mental Deficiency.

NY: John Wiley & Sons.
Keogh, B. K., & Kopp, C. B. (1978). From assessment to intervention:
F. D. Minifie & L. L. Lloyd (Eds.), *Communicative and cognitive abili*
assessment (pp. 523–547). Baltimore, MD: University Park Press.
Knobloch, H., & Pasamanick, B. (1960). Environmental factors affecting
before and after birth. *Pediatrics, 26,* 210–218.
Larson, S. A., Lakin, K. C., Anderson, L., Kwak, N., Lee, J. H., & A
Prevalence of mental retardation and developmental disabilities:
1994/1995 National Health Interview Survey Disability supplemen
on Mental Retardation, l06(3), 231–252.
Leiter, R. G. (1948). *Leiter International Performance Scale*. Chicago, IL:
Leiter, R. G. (1959). Part I of the manual for the 1948 revision of the
Performance Scale: Evidence of the reliability and validity of the Leit
Service Center Journal, 11, 1–72.
Leiter, R. G. (1969). *General instructions for the Leiter International Perfor*
IL: Stoelting.
Leonard, H., & Wen, X. (2002). The epidemiology of mental retarda
opportunities in the new millennium. *Mental Retardation and Deve*
Research Reviews, 8, 117–134.
Levenson, R. L., Jr., & Zino, T. C. (1979). II. Assessment of cognitiv
McCarthy scales and Stanford Binet: A correlational analysis. *Percep*
48, 291–295.
Lezak, M. D., Howieson, D. B., & Loring, D. W. (Eds.) (2004). *Neuropsy*
(4th ed.). New York, NY: Oxford University Press.
Lichtenberger, E. O., & Kaufman, A. S. (2004). *Essentials of WPPSI-III a*
NJ: John Wiley & Sons.
Locurto, C. M. (1991). *Sense and nonsense about IQ: The case for uniquer*
Praeger Publishers.
Madle, R. A. (2005). Test review of Wechsler Preschool and Primary Sca
R. A. Spies & B. S. Blake (Eds.), *The sixteenth mental measureme*
pp. 1115–1118). Lincoln, NE: University of Nebraska Press.
McCarthy, D. A. (1972). *Manual for the McCarthy Scales of Children's A*
TX: The Psychological Corporation.
Neisser, U. (Ed.) (1998). *The rising curve: Long-term gains in IQ and related m*
DC: American Psychological Association.
Phillips, B. L., Pasewark, R. A., & Tindall, R. C. (1978). Relationship am
of Children's Abilities, WPPSI, and Columbia Mental Maturity Sca
Schools, 15, 352–356.

TX: Author.
Roid, G. H. (2003a). *Stanford-Binet Intelligence Scales,* Fifth Edition. I
Publishing.
Roid, G. H. (2003b). *Stanford-Binet Intelligence Scales,* Fifth Edition. *Inter*
Edition. Itasca, IL: Riverside Publishing.
Roid, G. H., & Miller, L. J. (1997). *Leiter International Performance Scale–*
manual. Wood Dale, IL: Stoelting Co.
Sachs, H. T., & Barrett, R. P. (2000). Psychopathology in individuals with
In A. J. Sameroff, M. Lewis, & S. M. Miller (Eds.), *Handbo*
psychopathology (2nd ed., pp. 657–670). New York, NY: Kluwer
Publishers.
Sattler, J. M. (1992). *Assessment of children: Revised and updated* (3rd e
Jerome M. Sattler, Publisher, Inc.
Sattler, J. M. (2001). *Assessment of children: Cognitive applications* (4th e
Jerome M. Sattler, Publisher, Inc.
Slate, J. R., & Saarnio, D. A. (1995). Differences between WISC-III
A preliminary investigation. *Journal of Psychoeducational Assessment*
Spruill, J., Oakland, T., & Harrison, P. (2005). Assessment of mental retard
D. H. Saklofske, & L. G. Weiss (Eds.), *WISC-IV Clinical use and int*
practitioner perspectives (pp. 299–331). Burlington, MA: Elsevier Aca
Terman, L. M., & Merrill, M. A. (1960). *Stanford-Binet Intelligence*
Houghton Mifflin.
Thorndike, R. L., Hagen, E. P., & Sattler, J. M. (1986). *The Stanford-Binet*
Fourth Edition: Guide for administering and scoring. Itasca, IL: Rivers
Tredgold, A. F. (1908). *Mental deficiency*. London: Baillere, Tindall, & Fo
Tylenda, B., Hooper, S. R., & Barrett, R. P. (1987). Developmental le
C. L. Frame & J. L. Matson (Eds.), *Handbook of assessment in c*
Applied issues in differential diagnosis and treatment evaluation (pp. 1
NY: Plenum Press.
Vance, H., Maddux, C. D., Fuller, G. B., & Awadh, A. M. (1996). A longitu
WISC-III and WISC-R scores of special education students. *Psycholo*
113–118.
VanderVeer, B., & Schweid, E. (1974). Infant assessment: Stability of m
young retarded children. *American Journal of Mental Deficiency, 79,*
Wechsler, D. (1939). *The measurement of adult intelligence*. Baltimore, MD:
Wechsler, D. (1949). *Manual for the Wechsler Intelligence Scale for Childre*
The Psychological Corporation.
Wechsler, D. (1967). *Manual for the Wechsler Preschool and Primary Scal*
Antonio, TX: The Psychological Corporation.

Psychological Corporation.
Werner, E. E., Honzik, M. P., & Smith, R. S. (1968). Prediction of intellig
at ten years from twenty months pediatric and psychological examina
ment, 39, 1063–1075.
Zhu, Z., Weiss, L. G., Prifitera, A., & Coalson, D. (2004). The Wechsler I
Children and Adults. In M. Hersen (Chief Ed.), G. Goldstein, & S.
*Comprehensive handbook of psychological assessment: Vol. 1. Intellec
logical assessment* (pp. 51–75). Hoboken, NJ: John Wiley & Sons.

This page intentionally left

INSTITUTE, JOHNS HOPKINS UNIVERSITY SCHOOL OF M
BALTIMORE, MARYLAND 21205

I. HISTORY AND DEFINITION

Helping persons with intellectual disability (ID) reach the of independence is one of the most important endeavors who serve these persons. Adaptive skills are key to a independence. Indeed, training adaptive skills is among the goals for increasing the independence of persons with ID (& Bamburg, 1998). However, developing adaptive suppo should not be done blindly, but should be based on caref an individual's profile of adaptive strengths and weaknesse

Adaptive behavior assessment serves three broad goals (2002). These include diagnosis, classification, and planning professionals are increasingly turning their efforts to pla historically the primary reason for conducting adaptive beha remains that of diagnosis or classification. Nonetheless, th adaptive behavior in regards to planning supports should no

The degree to which an individual can successfully per activities encompassed by the construct of adaptive behavio consistent basis, will have a large impact on decisions co the least restrictive environment (Pollingue, 1987). Furthe development is often the primary factor determining the lev needed (Liss et al., 2001). Heller, Miller, and Hsieh (2002) tive behavior skills were higher in those residents who mov settings than those who stayed in nursing homes. These higher adaptive skills both before and after community plac that not only were adaptive skills improved by communit they were also indicative of which individuals would move f

0074-7750/07 $35.00
DOI: 10.

individuals behave in everyday life and for the diagnosis to
weighted by how they perform on measures of academic intel

ID is a classification that is used to determine eligibi
Throughout the past 100 years, researchers and policy make
with the basic problem that is common to all decisions reg
for services; that is, to include those in need of assistance a
who are not. On one hand, the definition of ID must be broa
exclude any individuals who should be included (type 2 erro
definition should not be so broad as to include individuals
additional support (type 1 error). The construct of adapti
emerged as a result of these efforts to balance these two
(Greenspan et al., 1996).

According to the *Diagnostic and Statistical Manual of M*
Fourth Edition Text Revision (DSM-IV-TR) published b
Psychiatric Association (2000), adaptive functioning refer
tively individuals cope with common life demands and hov
the standards of personal independence expected of someo
cular age group, sociocultural background, and communi
DSM-IV lists four levels of ID: mild, moderate, severe,
While significant limitations in adaptive functioning are a di
ment, the actual measurement of adaptive functioning is
briefly. Further, the DSM-IV's levels of ID are based solely o
intellectual functioning. This method is particularly strikin
DSM-IV's own statement that "impairments in adaptive fu
than low IQ, are usually the presenting symptoms in individ
Retardation" (p 42). In response to this inconsistency, some
that even though the DSM-IV indicates the use of well-standar
scales to assess adaptive functioning, than having no stand
cutoff points that establish what "significant limitation in ad
are, implies a general mistrust of the comprehensiveness a
adaptive assessment measures (Reschly, Myers, & Hartel,
these same limitations apply to measures of intelligence as
are akin to all norm-referenced assessment tools.

component. The most widely cited definition of adaptive be
forth by the American Association on Mental Retardation
recently, the AAMR has stated "adaptive behavior is
conceptual, social, and practical skills that have been lear
order to function in their everyday lives" (Luckasson et al
adaptive behavior is not merely one's ability to perform ac
It is a much broader concept that includes ones ability to a
to everyday settings and situations (Greenspan et al., 1996)

The American Association on Mental Deficiency (since
AAMR) formally added adaptive behavior to the definitio
(Heber, 1959). By adding adaptive limitations to the defi
AAMD attempted to correct the over reliance on IQ scores th
as well as to reduce the number of individuals without signifi
everyday tasks who were being classified as evincing ID base
standardized IQ test score (Luckasson et al., 2002). Nonet
standardized assessment measures of adaptive behavior were
1973, as social and legal pressures increased to require va
measurements to be used when determining a diagnosis of ID

The 1992 definition of ID by the AAMR made significa
overall diagnosis and classification of ID. One of the most
that came with the 1992 definition of ID was in regards t
of adaptive behavior. A shift was made from assessing a
in general to assessing adaptive skills across 10 categories.
time of the publication of the 1992 definition, there were no s
to assess all of these 10 areas, and there was little agreeme
necessity or adequacy of these 10 skill areas. Indeed, Lucka
list the changes regarding adaptive skills assessment as on
reasons for a general lack of adoption of the 1992 definition
empirical support for the 10 skill areas, the 2002 definition al
three broad areas of adaptive behavior composed of the 10

The current AAMR definition puts equal importance on
and adaptive skills. Further, with the 1992 definition, a pa
made in that persons are no longer classified according to

the overall structure of adaptive behavior. An understanding of adaptive behavior will change the way in which it is measu by practitioners.

Much debate has been over the issue of whether or not an a is a unified or multivariate construct. To explore this questi have been conducted examining the factor structure of adapti most comprehensive review is provided by Thompson, Bruininks (1999) who concluded that adaptive behavior a measured is a multidimensional construct consisting o Thompson et al. (1999) further noted that the number of fa related to the level at which the data were analyzed, with analy the item level finding more factors than analyses conducted at t

The five domains found by Thompson et al. (1999) we independence, (2) responsibility, (3) cognitive/academic, (4) munity, and (5) physical/development. The first three facto commonly found in their review of factor studies. Regarding found in their review, Thompson et al. note, "no single adap behavior assessment instrument completely measures the adaptive and maladaptive behavior dimensions."

In spite of these findings that support a multivariate m behavior, researchers and clinicians persist in using a unified a score for decision making (Lerman, Apgar, & Jordan, 2005). to practical concerns of meeting institutional standards or research design rather than a belief that adaptive behavior is b unified construct. Further, this tendency may simply be the r popular assessment scales providing a comprehensive score th assume is the best representation of the adaptive behavior co

III. REVIEW OF SCALES

A multitude of assessment scales have been constructed. scales abound, research using adaptive assessment scales ha limited to three: the Vineland Adaptive Behavior Scal

national service centers, Luiselli et al. (2001) found that th
most widely used assessment scale in persons with autism
three versions: a survey form, expanded form, and a cl
(Sparrow, Balla, & Cicchetti, 1984). The survey form and
are both versions of the interview edition.

Sparrow et al. (1984) note that the VABS may be us
assessment of a person's daily functioning is required. Th
are given in which the VABS may be used: diagnostic evalu
planning, and research. Diagnostic evaluations are listed a
use of the VABS. In regards to program planning, M
and Laud (2003) note that the VABS is useful for determin
training; however, they recommend using more narrow-ban
as the SPSS or MESSIER to provide more detailed inform
social functioning or other particular domains of adaptive

In a recent discussion of the VABS, Beail (2003) not
advantages and disadvantages. The advantages listed inc
the major domains of adaptive behavior, standardization, in
metrics, and brevity (Beail, 2003). The majority of the disadv
to the "age" of the scale, resulting in outdated norms or n
longer reflective of the target population. Beail noted that th
of the VABS had the potential to address many of these sho

The Vineland Adaptive Behavior Scales, Second Ed
Sparrow, Cicchetti, & Balla, 2005) builds off of the foundatio
Vineland scales. Due to its recent publication, the scale has n
for researchers to evaluate. However, Sparrow et al. (200
of changes in the second edition that were made as an e
measurement in very young children and adults.

Many of the changes listed by Sparrow et al. (2005) ap
the utility of the VABS to measure adaptive behavior in pers
mental disabilities, particularly for individuals with autis
changes are the addition of items to measure the develop
language, the ability to maintain or initiate conversation, to
use nonverbal communication, and the ability to maintain so
Further, items were added that address social naïveté, gullibili

B. AAMR Adaptive Behavior Scales

The AAMR Adaptive Behavior Scales (ABS) is the seco
AAMD Adaptive Behavior Scale and consists of two versi
Community (ABS-S:2; Lambert, Nihira, & Leland, 1993) an
and Community version (ABS-R:2; Nihira, Leland, & Lamb
are two parts to the ABS. Part one addresses adaptive ski
independence. Part two addresses maladaptive behavior. Ite
to measure an individual's typical performance of adaptive

The ABS-S:2 was standardized on both children with de
abilities and those with typical development. Norms are pro
duals aged 3–21 years. The ABS-S:2 is designed for identify
are significantly impaired in adaptive behavior relative to thei
ing an individual's strengths and weaknesses, measuring tra
and research.

The primary use of the ABS-R:2 is for determining an in
of adaptive strengths and weaknesses. The ABS-R:2 pro
individuals with ID and is intended to be used with indi
79 years of age. However, norms are not available for typi
adults. Thus, while the ABS-R:2 is reported useful for planni
version should not be used to determine if an individual war
of ID (Luckasson et al., 2002).

C. Scales of Independent Behavior—Revised

The Scales of Independent Behavior—Revised (SIB-R)
interview that measures both adaptive and problem behav
Woodcock, Weatherman, & Hill, 1996). The test is designed t
tive functioning across a variety of domains. A number of i
noted in the manual including identifying areas for train
eligibility for services, planning programs and services, moni
lized training programs, program evaluation, clinical asses
and classification for research (Bruininks et al., 1996). The SI

internalized, externalized, and asocial.

The SIB-R varies from other assessment scales of this nat ity that it allows in its administration. While the standa SIB-R is as a structured interview, a checklist-administrat available. As a checklist, a knowledgeable informant may co independently or a single respondent may complete check individuals at the same time during the course of a single in

The Inventory for Client and Agency Planning (ICAP; Weatherman, & Woodcock, 1986) is a 16-page booklet that teacher or care person who is familiar with the individual be adaptive behavior subscale of the ICAP was constructed fro from the original SIB. The ICAP is designed to be complet short amount of time (15 min). The ICAP provides a wide r tion about the individual and it is not limited solely to me behavior. The majority of studies using the ICAP have focu of community integration.

A number of well-developed adaptive assessment scales a choice of which adaptive scale to use should be determined purpose of the assessment. Frequency of use of a scale does is the most appropriate for all occasions. While this revie most commonly used scales (VABS, ABS, and SIB/ICAP), a assessment scales have been developed, such as the Battell Inventory, that also meet good psychometric standards (Res Not every scale possesses the same attributes such as admin age appropriateness of item content, or cultural relevance sionals must carefully consider their selection to ensure tha serves the intended purpose well.

IV. PSYCHOMETRIC CONCERNS

Issues of reliability and validity are common concerns f scales and are requisites for acceptance and utility (Amer Research Association, 1999). Researchers and clinicians sh

Basal and ceiling rules are used as a means to shorten the administer a scale. These rules are typically used by scales ac interview format that present items in an assumed devel By establishing a basal, it is assumed that the individual usu of the previous items that precede this basal level. Likewise, t that the individual does not or cannot perform the items follo Basals and ceilings are set once the interviewer obtains a ce items endorsed as present (basal) or endorsed as not present

When determining the ceiling, scales in which ceiling score rapidly may underestimate an individual's adaptive behav skills have developed atypically. For example, persons with ments may show limitations on tasks requiring fine motor score poorly on items concerning closing fasteners on clothi replaced buttons, dressing independently is no longer a ta assistance but one that can be done independently (Pollin such an individual, an early ceiling would have indicated overall dependence than is necessary. Flexibility in establish is needed.

One change made in the administration of the VABS-II fro a change in the basal and ceiling rules (Sparrow et al., 20 required full endorsement on seven consecutive items to and scores of zero on seven consecutive items to establish a and ceiling rules were relaxed for the VABS-II, requiring items to establish a basal or a ceiling. While this shortens th time, it may negatively impact those individuals who dem development within the same domain.

B. Item Sampling and Age Appropriateness

Adaptive scales are often used to evaluate children fo delay. As a result many scales have the highest item de early development. This allows for a good degree of sensi

may have adaptive skills equivalent to 12 months of age, th
(e.g., items) should not be used to establish the adaptive
12-month old level as would be used for a typically de
For example, reaching for a caregiver may be an expec
a12-month old typically developing infant but would not b
expect from an adult who is functioning at the same dev
nor would it be a behavior warranting training.

C. Indirect Assessments and Informant Validity/Reliabi

Due to limitations with communication skills or the
direct observations, the majority of scales designed for u
with ID rely on informant report. As a result, the utility of
tools are dependent on the degree to which informants are
reliably and validly concerning adaptive behavior. Most a
have addressed this concern by reporting the reliability of
different informants. While indirect assessment does have s
tions, it allows for examination across multiple settings and r
allows for the assessment of typical performance rather tha
mance as would be seen if the individual were asked to perfo
sake of assessment (Dykens, 1995).

Adaptive behavior is relative and dynamic, not absolute a
Fuchs, 1987). For this reason, consideration of place and ti
when assessing adaptive behavior. Different skills are nee
situations. Adaptive assessment needs to be broad and as
multiple settings (Dykens, 1995). However, the same informa
know or be able to report well on the adaptive behavior of the
function outside of the context in which they know them (S
Fisman, & Streiner, 1994; Voelker, Shore, Hakim-Larson,
Discrepancies among informants, while a concern for reliab
simply reflect the way in which the individual varies in adaptiv
multiple contexts. Practitioners must use careful clinical juc
investigation skills when dealing with such findings.

et al. (2003) found that those children without autistic beh
better across all domains of adaptive behavior but particula
ization skills when compared to individuals with fragile X. I
adaptive profile observed in autism, children with Wil
showed relatively high social skills but lower daily living
skills (Mervis, Klein-Tasman, & Mastin, 2001).

Carter et al. (1998) offer supplementary norms on the VAB
with autism. These norms are helpful in that they provide
description of the particular strengths and weaknesses for
autism. However, it should be noted that when adaptive
ments are used to determine diagnosis, the question is ho
performs relative to the general population, not simply to ot
a similar diagnosis.

E. Cultural Considerations

Cultural considerations when assessing adaptive behavior
that adaptive behavior is defined in relation to social norms
(Horn & Fuchs, 1987). For a scale to be useful it must a
sensitive (Dykens, 1995). While most comprehensive scales
assess adaptive behaviors that are culturally universal, this
that has been rarely tested. Craig and Tassé (1999) discu
factors related to adaptive behavior expectations that may
to an individual's culture. Among these factors are age
structure, and attitudes toward disabilities.

The age at which children are expected to perform specifi
based on the culture in which the child lives. Further, the ta
child may also vary. Learning to read may be an importan
developing within western culture. However, this skill may n
ble within other cultures and thus not fit the definition of a
when measured outside of the usual context. Likewise, diffe
expectations are common. Skills in one domain may be req

(1992) have developed a translation of the VABS and prese
evaluations of the psychometric properties. Further res
cross-cultural differences is needed. Not only are accurate
lations necessary but also accurate cultural translations
Research addressing these differences should lead to a bett
regarding which skills are truly universal and which are c
(Craig & Tassé, 1999).

V. REVIEW OF PUBLISHED STUDIES

The past 30 years have seen a tremendous increase in th
adaptive behavior as a consideration in the diagnosis of ID.
researchers developed assessment scales to measure this c
1999). However, little is known concerning which adaptiv
are used by researchers and practitioners. In a survey of
Centers, Luiselli et al. (2001) found that the VABS was the
used assessment measure. However, the study was limited t
used in the education and treatment of individuals with au
review is intended to provide information concerning whic
have been reported in studies on persons with ID over the

A. Literature Search

A search was made for all studies, which reported the u
behavior scale, that were published in four journals specializ
persons with ID. The journals included in this search we
Journal on Mental Retardation, Journal of Autism and Develop
Journal of Intellectual Disability Research, and *Research*
Disabilities. All studies published in the selected journals fr
2005 were reviewed for the inclusion of an adaptive scale. A
was defined according to the AAMR definition (Luckasso
"the collection of conceptual, social, and practical skills
learned by people in order to function in their everyd

B. Results

The review identified 271 studies that included the use behavior scale. From the 271 studies, it is clear that nume scales have been used. However, the identified studies prima use of three scales: VABS ($n = 177$), ABS ($n = 61$), and SIB Table I displays a breakdown of the identified studies in assessment used and the population studied.

The VABS was reported in 177 studies and was the included adaptive behavior scale. Of particular note is that ing on autism, the VABS was used almost exclusively. Th commensurate with those by Luiselli et al. (2001) who found the most widely used measure by practitioners for persons v current results indicate that researchers on autism, in ad tioners, also employ the VABS as the primary means to behavior.

The VABS was used for a number of purposes in the ident most frequently reported use was as a general measure of ad In these studies, VABS scores were often contrasted to ot participant factors such as residential placement, autism dia tive abilities. The second most common use of the VABS was individual's level of ID for purposes of group classificati describe the characteristics of the study participants. Howe reported using the VABS as a measure of maladaptive beha

Sixty-one of the identified studies reported use of the AB regarding the VABS, the primary purpose cited for includi for a general measure of adaptive behavior. In contrast to th a much larger portion of the studies including the ABS maladaptive or challenging behavior as a primary reason fo

As noted previously, the residential and community version not contain norms that represent both persons with and with this version is not appropriate for diagnosing ID (Luckass

de Bildt et al. (2005)	1059 children with ID
de Bildt, Kraijer, Sytema, & Minderaa (2005)	826 children and adolescents wi
de Bildt, Sytema, Kraijer, Sparrow, & Minderaa (2005)	186 children with ID
Billstedt, Gillbert, & Gillberg (2005)	108 adults with autism
Burt et al. (2005)	130 individuals with Down sync
Chadwick, Cuddy, Kusel, & Taylor (2005)	82 children with ID or autism
Dunn & Bates (2005)	36 individuals with autism or ty development
Edgin & Pennington (2005)	58 children with Asperger syndr autism, or typical development
Emerson, Robertson, & Wood (2005)	615 with ID
Emerson (2005)	1542 adults with ID
Fine et al. (2005)	98 children with autism, PDD
Gena, Couloura, & Kymissis (2005)	3 children with autism
Gross (2005)	83 children with autism, ID, developmental delay, or typical development
Harries, Guscia, Kirby, Nettelbeck, & Taplin (2005)	80 individuals with ID
Hassall, Rose, & McDonald (2005)	46 children with ID
Hastings, Kovshoff et al. (2005)	48 children with autism
Hastings, Beck, Daley, & Hill (2005)	338 children with ID
Howard, Sparkman, Cohen, Green, & Stanislaw (2005)	61 children with autism, PDD
Keen (2005)	6 children with autism
Kishore, Nizamie, & Nizamie (2005)	60 individuals with ID
Klin, Pauls, Schultz, & Volkmar (2005)	65 individuals with Asperger syndrome
Lecavalier (2005)	284 children with ID or typical development
Matson, Dixon, Matson, & Logan (2005)	618 adults with ID
Moss et al. (2005)	8 children with Cornelia de Lan
Oliver, Hall, & Murphy (2005)	16 children with ID or autism
Oliver, Holland, Hall, & Crayton (2005)	52 individuals with Down syndr
O'Reilly, Sigafoos, Lancioni, Edrisinha, & Andrews (2005)	1 adolescent with autism

Robertson et al. (2005)	25 adults with ID
Romski, Sevcik, Adamson, & Bakeman (2005)	33 individuals with ID
Sallows & Graupner (2005)	24 children with autism
Spreat, Conroy, & Fullerton (2005)	348 adults with ID
Stephens, Collins, & Dodder (2005)	2760 adults with ID
Veltman et al. (2005)	1 female with PDD
Werner, Dawson, Munson, & Osterling (2005)	145 children with autism, developmental delay, or typical development
Williams, Wishart, Pitcairn, & Willis (2005)	126 children with ID or Down syndrome
Yalon-Chamovitz & Greenspan (2005)	50 adults with ID
Zwaigenbaum, Sonnenberg, Heshka, Eastwood, & Xu (2005)	1 girl with PDD
Basquill, Nezu, Nezu, & Klein (2004)	45 individuals with ID
Beck, Daley, Hastings, & Stevenson (2004)	33 children with ID
de Bildt et al. (2004)	184 children with ID
Bradley, Summers, Wood, & Bryson (2004)	24 individuals with autism or ID
Eaves & Ho (2004)	49 children with autism or PDD
Graff & Green (2004)	3 children with ID and autism
Hatton et al. (2004)	560 adults with ID
Kishore, Nizamie, Nizamie, & Jahan (2004)	60 individuals with ID
Lecavalier, Aman, Hammer, Stoica, & Matthews (2004)	330 children with autism
LeGoff (2004)	47 children with autism, Asperge PDD
Miller, Fee, & Netterville (2004)	48 children with ID
Owen et al. (2004)	93 adults with ID
Ozonoff et al. (2004)	149 individuals with autism or ty development
Paul et al. (2004)	40 individuals with autism or PD
Prasher, Farooq, & Holder (2004)	150 adults with Down syndrome
Pruchno & McMullen (2004)	831 individuals with ID
Rellini, Tortolani, Trillo, Carbone, & Montecchi (2004)	65 children with autism, Asperge or PDD
Robertson et al. (2004)	50 individuals with ID

Zigman et al. (2004)	148 Down syndrome with ID
Baghdadli, Pascal, Grisi, & Aussilloux (2003)	222 children with autism
de Bildt et al. (2003)	1059 individuals with ID
Bosseler & Massaro (2003)	14 children with autism
Buhrow & Bradley-Johnson (2003)	60 children with ID or typical development
Cohen (2003)	84 children with autism
Cohen, Schmidt-Lackner, Romanczyk, & Sudhalter (2003)	311 children with autism, PDD, CDD, or Asperger syndrome
Dube, Mcllvane, Mazzitelli, & McNamara (2003)	13 individuals with ID, autism,
Fidler (2003)	36 children with ID or Down syndrome
Guralnick, Hammond, & Connor (2003)	72 individuals with and without
Guralnick, Neville, Connor, & Hammond (2003)	74 children with ID
Hall, Thorns, & Oliver (2003)	8 individuals with developmenta disabilities
Hatton et al. (2003)	70 children with Fragile X
Kay et al. (2003)	85 adults with Down syndrome
Kottorp, Bernspang, & Fisher (2003)	1724 individuals with ID
Lam, Giles, & Lavander (2003)	47 individuals with ID
Lancioni et al. (2003)	3 adults with ID
Mansell, Beadle-Brown, MacDonald, & Ashman (2003)	303 individuals with ID
Mount, Charman, Hastings, Reilly, & Cass (2003)	29 females with Rett syndrome
Nachshen, Woodford, & Minnes (2003)	106 individuals with Down synd autism, or fragile X
Niccols, Atkinson, & Pepler (2003)	41 children with Down syndrom
Oliver, Murphy, Hall, Arron, & Leggett (2003)	88 individuals with DD
Orsmond, Seltzer, Kraus, Hong (2003)	193 adults with ID
Ricci & Hodapp (2003)	50 individuals with Down syndr or ID
Rogers, Hepburn, & Wehner (2003)	102 individuals with autism, frag developmental delay, or typical development

Thompson & Bolton (2003)	1 adolescent male with Angelma syndrome
Tsatsanis et al. (2003)	26 children with autism
Urv, Zigman, & Silverman (2003)	529 adults with ID or Down syndrome
Van Bourgondien, Reichle, & Schopler (2003)	32 individuals with autism
Weiss, Diamond, Demark, & Lovald (2003)	97 individuals with ID
Bibby, Eikeseth, Martin, Mudford, & Reeves (2002)	66 children with autism
Copeland, Hughes, Agran, Wehmeyer, & Fowler (2002)	4 adolescents with ID
Dekker, Nunn, & Koot (2002)	1057 children with ID
Duker, van Driel, & van de Bercken (2002)	77 individuals with Down syndr or PWS
Duvdevany (2002)	31 individuals with ID
Einam & Cuskelly (2002)	50 children with ID or typical development
Fisch, Simensen, & Schroer (2002)	36 children with autism or Fragi
Gonzalez-Gordon, Salvador-Carulla, Romero, Gonzalez-Saiz, & Romero (2002)	80 individuals with ID
Grigorenko et al. (2002)	80 children with developmental d
Grissom & Borkowski (2002)	54 siblings of individuals with ID
Gross (2002)	55 children with autism, ID, developmental delay, or typical development
Gunter, Ghaziuddin, & Ellis (2002)	16 individuals with Asperger syndrome or typical developmen
Guralnick (2002)	64 children with ID or Down syndrome
Hallam et al. (2002)	500 individuals with ID
Kravits, Kamps, Kemmerer, & Potucek (2002)	1 girl with autism
Mansell, Ashman, Macdonald, & Beadle-Brown (2002)	495 individuals with ID
Mansell, Elliott, Beadle-Brown, Ashman, & Macdonald (2002)	49 adults with ID

Richards, Williams, & Follette (2002)	30 adults with ID
Rousey, Wild, & Blacher (2002)	64 children with ID
Smith, Felce, Ahmed et al. (2002)	56 individuals with ID
Smith, Felce, Jones, & Lowe (2002)	106 adults with ID
South et al. (2002)	119 children with autism
Spreat & Conroy (2002)	177 individuals with ID
Stancliffe, Hayden, Larson, & Lakin (2002)	148 individuals with ID
Wallace, Webb, & Schluter (2002)	168 individuals with ID
Zigman, Schupf, Urv, Zigman, & Silverman (2002)	646 adults with ID
Bailey, Hatton, Tassone, Skinner, & Taylor (2001)	53 males with fragile X
Balboni, Pedrabissi, Molteni, & Villa (2001)	226 individuals with ID
Belser & Sudhalter (2001)	30 individuals with fragile X, au or ID
Cooper & Browder (2001)	8 adults with ID
Duker, Averink, & Melein (2001)	8 children with ID
Eikeseth & Jahr (2001)	7 children with autism or typica development
Emerson et al. (2001)	270 individuals with ID
Hall, Oliver, & Murphy (2001)	16 children with ID
Hatton et al. (2001)	814 adults with ID
Jones et al. (2001)	106 individuals with ID
Liss et al. (2001)	123 children with ID or autism
McCarthy & Boyd (2001)	52 individuals with Down syndr
Mervis, Klein-Tasman, & Mastin (2001)	41 children with Williams syndr
Miltiades & Pruchno (2001)	305 individuals with ID
O'Reilly & Lancioni (2001)	1 boy with Williams syndrome
Roberts, Mirrett, & Burchinal (2001)	39 boys with Fragile X syndrom
Skinner, Correa, Skinner, & Bailey (2001)	250 children with ID
Sudhalter & Belser (2001)	30 individuals with Fragile X, au or ID
Taubman et al. (2001)	8 children with ID
Temple, Jozsvai, Konstantareas, & Hewitt (2001)	35 adults with Down syndrome
Zarcone et al. (2001)	20 individuals with ID

Fitzgerald et al. (2000)	5 individuals with PKU
Gillham, Carter, Volkmar, & Sparrow (2000)	95 individuals with autism, PDD developmental delay.
Keogh, Garnier, Bernheimer, & Gallimore (2000)	80 children with developmental d
Laushey & Heflin (2000)	2 children with autism
Liss, Fein, Bullard, & Robins (2000)	85 individuals with autism, PDD typical development
Mudford et al. (2000)	16 children with autism
Oliver, Crayton, Holland, & Hall (2000)	49 adults with Down syndrome
Robertson et al. (2000)	500 individuals with ID
Smith, Groen, & Wynn (2000)	28 children with autism or PDD
Stancliffe, Abery, & Smith (2000)	74 adults with ID
Verri, Uggetti, Vallero, Ceroni, & Federico (2000)	1 adult male with ID
Weber, Egelhoff, McKellop, & Franz (2000)	29 individuals with tuberous scle
Werner, Dawson, Osterling, & Dinno (2000)	30 individuals with autism or typ development
Zwaigenbaum et al. (2000)	2 boys with autism
Assumpcao, Santos, Rosario, & Mercadante (1999)	3 individuals with autism
Baranek (1999)	32 children with autism, developmental delay, or typical development
Coe et al. (1999)	88 children with Down syndrom typical development
Cosgrave, Tyrrell, McCarron, Gill, & Lawlor (1999)	128 individuals with Down synd
Dacey, Nelson, & Stoeckel (1999)	40 adults with ID
Duker (1999)	126 individuals with ID
El-Ghoroury & Romanczyk (1999)	9 children with autism
Freeman, Del'Homme, Guthrie, & Zhang (1999)	210 children with autism
Hannah & Midlarsky (1999)	100 siblings on individuals with
Hardan & Sahl (1999)	233 individuals with ID
Hughes et al. (1999)	24 children with ID or typical development
Jones et al. (1999)	19 adults with ID

Matson, Bielecki, Mayville, Smalls, Bamburg, & Baglio, (1999)	169 adults with ID
McDermott, Martin, Weinrich, & Kelly (1999)	252 women with ID
Murphy, Hall, Oliver, & Kissi-Debra (1999)	614 children with developmenta delay, autism, or typical develop
Njardvik, Matson, & Cherry (1999)	36 adults with ID
Rogers et al. (1999)	194 children with autism
Romski, Sevcik, & Adamson (1999)	13 children with ID
Sicotte & Stemberger (1999)	28 children with PDD
Stella, Mundy, & Tuchman (1999)	90 children with autism or PDD
Stone, Ousley, Hepburn, Hogan, & Brown (1999)	60 individuals with autism or developmental delay
Wall & Gast (1999)	12 adolescents with ID
Walsh & Shenouda (1999)	284 individuals with ID
Zarcone, Crosland, Fisher, Worsdell, & Herman (1999)	5 children with ID
Ashaye, Fernando, Kohen, Mathew, & Orrell (1998)	144 adults with ID
Bacon, Fein, Morris, Waterhouse, & Allen (1998)	193 individuals with autism, develpomental delay, ID, and ty development
Bailey, Mesibov et al. (1998)	57 boys with Fragile X syndrom
Bailey, Hatton, & Skinner (1998)	46 boys with Fragile X syndrom
Beardsmore, Dorman, Cooper, & Webb (1998)	23 adults with Prader–Willi synd
Burt et al. (1998)	70 adults with Down syndrome
Carter et al. (1998)	684 individuals with autism
Chung (1998)	1 adolescent female with ID
Clare, Garnier, & Gallimore (1998)	103 children with developmenta delay
Clarke, Boer et al. (1998)	6 individuals with Prader–Willi syndrome
Dawson, Matson, & Cherry (1998)	36 adults with autism, PDD, or
Dawson, Meltzoff, Osterling, Rinaldi, & Brown (1998)	59 individuals with autism, Dow syndrome, or typical developme
Dykens & Smith (1998)	105 children and adolescents wi Smith–Magenis syndrome or Prader–Willi syndrome

Smith (1998)	
Koegel, Camarata, Valdez-Menchaca, & Koegel (1998)	3 children with autism
Lancioni, O'Reilly, Campodonico, & Mantini (1998a)	4 adults with ID
Lancioni, O'Reilly, Campodonico, & Mantini (1998b)	3 women with ID
Levitas & Reid (1998)	13 individuals with Rubinstein–T syndrome
Linuma, Minami, Cho, Kajii, & Pachi (1998)	130 individuals with ID or typica development
Lowe, Felce, Perry, Baxter, & Jones (1998)	41 adults with ID
Matson Carlisle, & Bamburg (1998)	892 individuals with ID
Mazzocco, Baumgardner, Freund, & Reiss (1998)	17 girls with Fragile X syndrome Turner syndrome
Moss et al. (1998)	201 individuals with ID
Prasher, Chung, & Haque (1998)	128 adults with Down syndrome
Prosser et al. (1998)	68 individuals with ID
Rose, Jones, & Fletcher (1998)	24 adults with ID
Spreat, Conroy, & Rice (1998)	40 individuals with ID
Stancliffe & Hayden (1998)	71 individuals with ID
Stancliffe & Lakin (1998)	187 individuals with ID
Turk & Cornish (1998)	42 boys with Fragile X, Down syndrome, or typical developmer
Udwin, Howlin, Davies, & Mannion (1998)	70 adults with Williams syndrom
Van Bourgondien, Reichle, Campbell, & Mesibov (1998)	52 adults with autism
Zappella, Gillberg, & Ehlers (1998)	30 individuals with autism
Borthwick-Duffy, Lane, & Widaman (1997)	67 children with ID
Boutin et al. (1997)	67 individuals with autism or ID
Dykens, Finucane, & Gayley (1997)	10 individuals with Smith–Mage syndrome
Field et al. (1997)	22 children with autism
Horrigan & Barnhill (1997)	11 male individuals with autism
Jenkins, Rose, & Lovell (1997)	39 individuals with ID
Konstantareas & Lunsky (1997)	31 individuals with autism or developmental delay
Lord et al. (1997)	319 individuals with autism

	ID
Seal & Bonvillian (1997)	14 adolescents with autism
Smith, Eikeseth, Klevstrand, & Lovaas (1997)	21 children with ID and PDD
VanMeter, Fein, Morris, Waterhouse, & Allen (1997)	children with autism, ID, or typ development
Brinton & Fujiki (1996)	44 individuals with ID
Brooke, Collacott, & Bhaumik (1996)	1 individual with ID
Cameron, Luiselli, Littleton, & Ferrelli (1996)	1 adolescent female with ID
Carpentieri & Morgan (1996)	40 children with autism or ID
Dykens et al. (1996)	29 individuals with Fragile X syndrome
Ghaziuddin & Gerstein (1996)	17 individuals with Asperger syndrome
Koegel, Bimbela, & Schreibman (1996)	17 children with autism
Lowe, Felce, & Blackman (1996)	51 individuals with ID
Luscre & Center (1996)	3 children with autism
Maaskant et al. (1996)	1602 adults with ID
Prasher & Hall (1996)	201 adults with Down syndrom
Simon, Rosen, & Ponpipom (1996)	86 individuals with ID
Smith & Van Houten (1996)	15 children with developmental or typical development
Turner, Realon, Irvin, & Robinson (1996)	3 individuals with ID
Waterhouse et al. (1996)	194 children with autism or PD
Williams (1996)	25 individuals with ID
Wilson, Seaman, & Nettlebeck (1996)	60 individuals with ID
Zanolli, Daggett, & Adams (1996)	2 boys with autism

ABS—Adaptive Behavior Scale; ABDQ—Adaptive Behavior Dem ADL—Activities of Daily Living; BDI—Battelle Development Invent Development Survey; CDER—Child Development Evaluation Repo Assessment Schedule; DDP—Developmental Disabilities Profile; DDQ Disabilities Quality Assurance Questionnaire; DLSQ—Daily Living DNS—Disability Needs Scale; DP-II—Developmental Profile II; ICAP— and Agency Planning; LDCS—Learning Disability Casemix Scale; Research Council Handicaps, Behavior, and Skills Schedule; OMFAQ—O Functioning Assessment Questionnaire; PDDBI—PDD Behavior Invento Adaptive Behavior Scales; SIB—Scales of Independent Behavior.

as a checklist directly by the informant. However, only three studies administered the SIB in a checklist format.

The form of the SIB/ICAP used varied among studies with frequently choosing to include the ICAP rather than the SIB the breadth of information gathered by the ICAP and the sh tration for adaptive behavior assessment, it is understandable would choose this version, particularly if adaptive behavior as central to their research question. However, the shorter adm comes at the cost of less specific and descriptive information th of the SIB-R provides.

The primary purpose cited for including any of these ad scales was to provide a measure of general adaptive behavio terms that researchers used to describe how the scores wer what the scores represented were variable among studie researches cited "overall developmental maturity" (Baran "functional and communication abilities" (Paul et al., 2005 lectual disability" (Hastings, Beck, Daley, & Hill, 2005), or quotient" (Oliver, Hall, & Murphy, 2005) as purposes fo the VABS. Much of this variability is surely due to the fact have multiple uses or that only one aspect of the scale wa respective study (e.g., social skills in Klin, Pauls, Schultz, & However, the numerous definitions of what the scales were us cited in the identified studies also suggests that there still rem amount of uncertainty or disagreement regarding the const behavior.

Researchers are increasingly using adaptive scales not simp purposes within research studies but also to evaluate differe behaviors within groups of individuals. As noted previous work has focused on persons with autism. However, it is evi ining Table I that many other diagnostic groups have been e encouraging in that it signifies that researchers have moved evaluating intellectual differences among diagnostic categor examining differences among adaptive skills (e.g. Hatton et

VI. CONCLUSION

Adaptive behavior scales play an important role in help
diagnose, plan supports, or determine an individual's level
Much research has been conducted to develop specific
examine the underlying construct that these scales are desi
While much progress has been made in this regard, a signi
confusion or disagreement still appears to remain regarding
construct and the most appropriate way to measure it.

The construct of adaptive behavior is fundamental to any
Current definitions of ID (e.g., DSM-IV; AAMR) include a
as a component, but place adaptive behavior at different leve
In the DSM-IV, adaptive behavior is a diagnostic requ
measurement of the construct is only briefly discussed, wh
definition puts a greater weight on the adaptive behavior
specifically requires the use of assessment scales standardized
with and without disabilities (Luckasson et al., 2002).

While debate may still continue, it is reasonable to conclu
behavior is a multidimensional construct (Thompson et al.,
the most widely used adaptive behavior scales continue to
composite score in addition to individual domain scor
researchers continue to report a general adaptive score, the
to evaluate differences or measure change on the more speci
(Paul et al., 2004).

There are a number of unique concerns regarding the psy
erties of tests when applied to persons with ID. First, prac
consider the manner in which ceiling and basal scores are es
in which ceiling scores are established rapidly may underes
dual's abilities in that domain if the skills have develope
order. Likewise, establishing a basal too early may overesti
It may not be safe to assume that the person is able to perfor
is truly foundational to abilities that have been assessed. A
ation when applying adaptive behavior scales to individua

individuals from other cultural backgrounds is needed.

A myriad of adaptive scales have been published (Spreat, this review found that researchers over the past 10 years hav three adaptive behavior scales. The scales identified most fre VABS, the ABS, and the SIB/ICAP. Researchers have m scales to measure participants' general level of adaptive behav were less frequently used to establish a diagnosis of ID, as m previous diagnoses that the individuals had received through

It is unclear from this chapter the extent to which adaptiv are used by clinicians to develop individual supports for p However, the dearth of research studies reporting the use of a scales to serve this purpose is cause for concern. First, while report the utility of these scales to serve this purpose, little evi to indicate how well these scales perform this task. Indeed regarding what information provided by adaptive behavior to the task of maximizing independence.

REFERENCES

Accardo, P. J., & Capute, A. J. (1998). Mental retardations. *Mental Reta mental Disabilities Research Reviews, 4,* 2–5.

Aman, M. G., Singh, N. N., Stewart, A. W., & Field, C. J. (1985). The Checklist: A behavior rating scale for the assessment of treatment effec *of Mental Deficiency, 89,* 485–491.

American Educational Research Association (1999). Standards for educati testing. Washington DC: Author.

American Psychiatric Association (2000). Diagnostic and statistical manua (4th ed., text rev.). Washington, DC: Author.

Anastasi, A., & Urbina, S. (1997). Psychological Testing (7th ed.). Uppe Prentice Hall.

Ashaye, O., Fernando, L., Kohen, D., Mathew, G., & Orrell, M. (1998). A study of older long-stay clients with intellectual disability using the D Schedule. *Journal of Intellectual Disability Research, 42,* 131–136.

Assumpcao, F., Santos, R. C. S., Rosario, M., & Mercadante, M. (1999). A syndrome. *Journal of Autism and Developmental Disorders, 29,* 179–1

Bailey, D. B. Jr., Hatton, D. D., Tassone, F., Skinner, M., & Taylor, A. K.
FMRP and early development in males with Fragile X syndrome.
Mental Retardation, 106, 16–27.
Bailey, D. B. Jr., Mesibov, G. B., Hatton, D. D., Clark, R. D., Roberts,
(1998). Autistic behavior in young boys with Fragile X syndrome. *J*
Developmental Disorders, 28, 499–508.
Balboni, G., Pedrabissi, L., Molteni, M., & Villa, S. (2001). Discriminant va
Scales: Score profiles of individuals with mental retardation and
American Journal on Mental Retardation, 106, 162–172.
Baranek, G. T. (1999). Autism during infancy: A retrospective video anal
and social behaviors at 9–12 months of age. *Journal of Autism and Dev*
29, 213–242.
Baranek, G. T., Danko, C. D., Skinner, M. L., Bailey, D. B. Jr., Hatton,
et al. (2005). Video analysis of sensory-motor features in infants with F
9–12 months of age. *Journal of Autism and Developmental Disorders,*
Basquill, M. F., Nezu, C. M., Nezu, A. M., & Klein, T. L. (2004). Aggre
bias and social problem-solving deficits in adult males with mental r
Journal on Mental Retardation, 109, 255–263.
Beail, N. (2003). Utility of the Vineland Adaptive Behavior Scales in diagn
adults who have mental retardation. *Mental Retardation, 41,* 286–28
Beardsmore, A., Dorman, T., Cooper, S. A., & Webb, T. (1998). Affective
Willi syndrome. *Journal of Intellectual Disability Research, 42,* 463–4
Beck, A., Daley, D., Hastings, R. P., & Stevenson, J. (2004). Mother
towards children with and without intellectual disabilities. *Journal of*
Research, 48, 628–638.
Belser, R. C., & Sudhalter, V. (2001). Conversational characteristics of ch
syndrome: Repetitive speech. *American Journal on Mental Retardatio*
Berument, S. K., Starr, E., Pickles, A., Tomlins, M., Papanikolauous, K.,
Pre-linguistic Autism Diagnostic Observation Schedule adapted for c
severe to profound mental retardation: A pilot study*Journal of Autis*
Disorders, 35, 821–829.
Bibby, P., Eikeseth, S., Martin, N. T., Mudford, O. C., & Reeves, D.
outcomes for children with autism receiving parent-managed int
Research in Developmental Disabilities, 23, 81–104.
Billstedt, E., Gillbert, C., & Gillberg, C. (2005). Autism after Adolescen
13- to 22-year follow-up study of 120 individuals with autism dia
Journal of Autism and Developmental Disorders, 35, 351–360.

disability with and without autism. *Journal of Autism and Developr* 151–161.

Brinton, B., & Fujiki, M. (1996). Responses to requests for clarification adults with mental retardation. *Research in Developmental Disabilitie*

Brooke, S., Collacott, R. A., & Bhaumik, S. (1996). Monosymptoma psychosis in a man with learning disabilities. *Journal of Intellectual 40,* 71–74.

Bruininks, R., Hill, B., Weatherman, R., & Woodcock, R. (1986). Exam Inventory for Client and Agency Planning. Chicago: Riverside.

Bruininks, R. H., Wookcock, R. W., Weatherman, R. F., & Hill, B. Independent Behavior-Revised. Itasca, IL: Riverside.

Buhrow, M., & Bradley-Johnson, S. (2003). Visual preferences of students v retardation and healthy, full-term infants. *Research in Developme* 83–94.

Burt, D. B., Loveland, K. A., Primeaux-Hart, S., Chen, Y., Philips, N. B., C (1998). Dementia in adults with Down syndrome: Diagnostic challen *on Mental Retardation, 103,* 130–145.

Burt, D. B., Primeaux-Hart, S., Loveland, K. A., Cleveland, L. A., Lewis, K (2005). Aging in adults with intellectual disabilities. *American Journa tion, 110,* 268–284.

Cameron, M. I., Luiselli, J. K., Littleton, R. F. Jr., & Ferrelli, L. (1996). and stimulus control assessment of a behavior deceleration treatment *Developmental Disabilities, 17,* 203–215.

Carpentieri, S., & Morgan, S. B. (1996). Adaptive and intellectual fu and nonautistic retarded children. *Journal of Autism and Developn* 611–620.

Carter, A. S., Volkmar, F. R., Sparrow, S. S., Wang, J. J., Lord, C., Daws The Vineland Adaptive Behavior Scales: Supplementary norms for ind *Journal of Autism and Developmental Disorders, 28,* 287–302.

Chadwick, O., Cuddy, M., Kusel, Y., & Taylor, E. (2005). Handicaps and skills between childhood and early adolescence in young people wi disabilities. *Journal of Intellectual Disability Research, 49,* 877–888.

Chadwick, O., Piroth, N., Walker, J., Bernard, S., & Taylor, E. (2000). Fac of behaviour problems in children with severe intellectual disability. *J Disability Research, 44,* 108–123.

Charlop-Christy, M. H., Le, L., & Freeman, K. A. (2000). A comparison of *in vivo* modeling for teaching children with autism. *Journal of Autism Disorders, 30,* 537–552.

Autism and Developmental Disorders, 29, 149–156.
Cohen, I. L. (2003). Criterion-related validity of the PDD Behavior Invento
and Developmental Disorders, 33, 47–53.
Cohen, I. L., Schmidt-Lackner, S., Romanczyk, R., & Sudhalter, V. (2003
Inventory: A rating scale for assessing response to intervention in ch
Developmental Disorder. *Journal of Autism and Developmental Diso*
Cooper, K. J., & Browder, D. M. (2001). Preparing staff to enhance active p
with severe disabilities by offering choice and prompting performance
purchasing activity. *Research in Developmental Disabilities, 22,* 1–20.
Copeland, S. R., Hughes, C., Agran, M., Wehmeyer, M. L., & Fowl
intervention package to support high school students with mental r
education classrooms. *American Journal on Mental Retardation, 107,*
Cosgrave, M. P., Tyrrell, J., McCarron, M., Gill, M., & Lawlor, B. A. (19
aggression, and adaptive and maladaptive behaviour in older peop
drome with and without dementia. *Journal of Intellectual Disability R*
Craig, E., & Tassé, M. J. (1999). Cultural and demographic group com
behavior. In R. L. Schalock (Ed.), Adaptive Behavior and Its Measu
for the Field of Mental Retardation. Washington, DC: AAMR.
Dacey, C. M., Nelson, W. M. III, & Stoeckel, J. (1999). Reliability, criterio
qualitative comments of the Fourth Edition of the Stanford-Binet Int
young adult population with intellectual disability. *Journal of I*
Research, 43, 179–184.
Dawson, G., Meltzoff, A. N., Osterling, J., Rinaldi, J., & Brown, E. (1998).
fail to orient to naturally occurring social stimuli. *Journal of Autis*
Disorders, 28, 479–485.
Dawson, J. E., Matson, J. L., & Cherry, K. E. (1998). An analysis of mal
persons with autism, PDD-NOS, and mental retardation. *Resear*
Disabilities, 19, 439–448.
de Bildt, A., Kraijer, D., Sytema, S., & Minderaa, R. (2005). The psychom
Vineland Adaptive Behavior Scales in children and adolescents with
Journal of Autism and Developmental Disorders, 35, 53–62.
de Bildt, A., Serra, M., Luteijn, E., Kraijer, D., Sytema, D., & Minderaa, R
in children with intellectual disabilities with and without autism. *J*
Disability Research, 49, 317–328.
de Bildt, A., Sytema, S., Ketelaars, C., Kraijer, D., Mulder, E., Volkm
Interrelationship between Autism Diagnostic Observation Schedule
Autism Diagnostic Interview-Revised (ADI-R), and the Diagnostic a
of Mental Disorders (DSM-IV-TR) classification in children and ad
retardation. *Journal of Autism and Developmental Disorders, 34,* 129-

Doll, E. A. (1965). Vineland Social Maturity Scale. Circle Pines, MN: Service, Inc.
Dube, W. V., McIlvane, W. J., Mazzitelli, K., & McNamara, B. (2003). R and behavioral momentum in individuals with developmental d *Journal on Mental Retardation, 108,* 134–143.
Duker, P. C. (1999). The Verbal Behavior Assessment Scale (V validity, reliability, and internal consistency. *Research in Developme* 347–353.
Duker, P. C., Averink, M., & Melein, L. (2001). Response restriction as a diurnal bladder control. *American Journal on Mental Retardation, 10*
Duker, P. C., van Driel, S., & van de Bercken, J. (2002). Communication p with Down's syndrome, Angelman syndrome and pervasive deve *Journal of Intellectual Disability Research, 46,* 35–40.
Dunn, M. A., & Bates, J. C. (2005). Developmental change in neutral pro children with autism. *Journal of Autism and Developmental Disorders,*
Duvdevany, I. (2002). Self-concept and adaptive behaviour of people with in integrated and segregated recreation activities. *Journal of Intellectua* *46,* 419–429.
Dykens, E. M. (1995). Adaptive behavior in males with fragile X syndrome *and Developmental Disabilities Research Reviews, 1,* 281–285.
Dykens, E. M., Finucane, B. M., & Gayley, C. (1997). Cognitive and in persons with Smith-Magenis syndrome. *Journal of Autism and Deve* *27,* 203–211.
Dykens, E., Ort, S., Cohen, I., Finucane, B., Spiridigliozzi, G., Lachiewi Trajectories and profiles of adaptive behavior in males with Fragile X ter studies. *Journal of Autism and Developmental Disorders, 26,* 287–3
Dykens, E. M., & Smith, A. C. M. (1998). Distinctiveness and correlates of n in children and adolescents with Smith-Magenis syndrome. *Journal of* *Research, 42,* 481–489.
Eaves, L. C., & Ho, H. H. (2004). The very early identification of autism: O *Journal of Autism and Developmental Disorders, 34,* 367–378.
Edgin, J. O., & Pennington, B. F. (2005). Spatial cognition in Autism Superior, impaired, or just intact? *Journal of Autism and Developm* 729–745.
Eikeseth, S., & Jahr, E. (2001). The UCLA reading and writing program: beginning stages. *Research in Developmental Disabilities, 22,* 289–307
Einam, M., & Cuskelly, M. (2002). Paid employment of mothers and fath with multiple disabilities. *Journal of Intellectual Disability Research, 4*

105, 81–102.
Emerson, E., Robertson, J., & Wood, J. (2005). Emotional and behaviou
and adolescents with intellectual disabilities in an urban conurbation.
Disability Research, 49, 16–24.
Espie, C. A., Paul, A., McFie, J., Amos, P., Hamilton, D., McColl, J. H
studies of adults with severe or profound mental retardation an
Journal on Mental Retardation, 103, 47–59.
Felce, D., Bowley, C., Baxter, H., Jones, E., Lowe, K., & Emerson, E. (200
staff support: Evaluating Active Support training using a conditional
Research in Developmental Disabilities, 21, 243–255.
Fidler, D. J. (2003). Parental vocalizations and perceived immaturity
American Journal on Mental Retardation, 108, 425–434.
Field, T., Lasko, D., Mundy, P., Henteleff, T., Kabat, S., Talpins, S., e
children's attentiveness and responsivity improve after touch therap
and Developmental Disorders, 27, 333–338.
Fine, S. E., Weissman, A., Gerdes, M., Pinto-Martin, J., Zackai,
McGinn, D. M., et al. (2005). Autism Spectrum Disorders and s
with molecularly confirmed 22q11.2 deletion syndrome. *Journal of*
mental Disorders, 35, 461–470.
Fisch, G. S., Simensen, J., & Schroer, R. J. (2002). Longitudinal chan
adaptive behavior scores in children and adolescents with the Fragile X
Journal of Autism and Developmental Disorders, 32, 107–114.
Fitzgerald, B., Morgan, J., Keene, N., Rollinson, R., Hodgson, A., &
(2000). An investigation into diet treatment for adults with previously
tonuria and severe intellectual disability. *Journal of Intellectual Di*
53–59.
Freeman, B. J., Del'Homme, M., Guthrie, D., & Zhang, F. (1999). Vinelan
Scale scores as a function of age and initial IQ in 210 autistic children.
Developmental Disorders, 29, 379–384.
Gena, A., Couloura, S., & Kymissis, E. (2005). Modifying the affective beh
with autism using *in-vivo* or video modeling and reinforcement con
Autism and Developmental Disorders, 35, 545–556.
Gillham, J. E., Carter, A. S., Volkmar, F. R., & Sparrow, S. S. (2000). Tow
operational definition of autism. *Journal of Autism and Developr*
269–278.
Ghaziuddin, M., & Gerstein, L. (1996). Pedantic speaking style differen
drome from high-functioning autism. *Journal of Autism and Develop*
585–595.

A descriptive study of hyperlexia in a clinically referred sample of ch
mental delays. *Journal of Autism and Developmental Disorders, 32,* 3–
Grissom, M. O., & Borkowski, J. G. (2002). Self-efficacy in adolescents who
without disabilities. *American Journal on Mental Retardation, 107,* 79
Gross, T. F. (2002). Perception of human and nonhuman facial age by deve
children. *Journal of Autism and Developmental Disorders, 32,* 169–179
Gross, T. F. (2005). Global local precedence in the perception of facia
expression by children with autism and other developmental disabiliti
and Developmental Disorders, 35, 773–785.
Gunter, H. L., Ghaziuddin, M., & Ellis, H. D. (2002). Asperger syndr
hemisphere functioning and interhemispheric communication. *Jou*
Developmental Disorders, 32, 263–281.
Guralnick, M. J. (2002). Involvement with peers: comparisons between you
without Down's syndrome. *Journal of Intellectual Disability Research*
Guralnick, M. J., Hammond, M. A., & Connor, R. T. (2003). Subtype
Comparisons between young children with and without developmen
Journal on Mental Retardation, 108, 347–362.
Guralnick, M. J., Neville, B., Connor, R. T., & Hammond, M. A. (20
associated with the peer social competence of young children with m
Journal on Mental Retardation, 108, 272–287.
Hall, S., Oliver, C., & Murphy, G. (2001). Early development of self
An empirical study. *American Journal on Mental Retardation, 106,* 18
Hall, S., Thorns, T., & Oliver, C. (2003). Structural and environment
stereotyped behaviors. *American Journal on Mental Retardation, 108,*
Hallam, A., Knapp, M., Järbrink, K., Netten, A., Emerson, E., Robertson,
of village community, residential campus and dispersed housing prov
intellectual disability. *Journal of Intellectual Disability Research, 46,* 3
Hannah, M. E., & Midlarsky, E. (1999). Competence and adjustment of sib
mental retardation. *American Journal on Mental Retardation, 104,* 22
Hardan, A., & Sahl, R. (1999). Suicidal behavior in children and adolescent
disorders. *Research in Developmental Disabilities, 20,* 287–296.
Harries, J., Guscia, R., Kirby, N., Nettelbeck, T., & Taplin, J. (2005).
adaptive behaviors. *American Journal on Mental Retardation, 110,* 39
Hassall, R., Rose, J., & McDonald, J. (2005). Parenting stress in mothers
intellectual disability: The effects of parental cognitions in relation to
and family support. *Journal of Intellectual Disability Research, 49,* 40
Hastings, R. P., Beck, A., Daley, D., & Hill, C. (2005). Symptoms of ADHD
in children with intellectual disabilities. *Research in Developmental Dis*

et al. (2003). Adaptive behavior in children with fragile X syndrome.
Mental Retardation, 108, 373–390.
Heber, R. (1959). A manual on terminology and classification in mental r
Journal on Mental Deficiency (monograph suppl.), 64(2), 1–111.
Heller, T., Factor, A. R., Hsieh, K., & Hahn, J. E. (1998). Impact of age a
nursing homes for adults with developmental disabilities. *America*
Retardation, 103, 236–248.
Heller, T., Miller, A. B., & Factor, A. (1998). Environmental characteris
and community-based settings, and the well-being of adults with i
Journal of Intellectual Disability Research, 42, 418–428.
Heller, T., Miller, A. B., & Hsieh, K. (2002). Eight-year follow-up of the imp
characteristics on well-being of adults with developmental disabilities
40, 366–378.
Horn, E., & Fuchs, D. (1987). Using adaptive behavior in assessme
An overview. *The Journal of Special Education, 21,* 11–26.
Horrigan, J. P., & Barnhill, L. J. (1997). Risperidone and explosive aggre
of Autism and Developmental Disorders, 27, 313–323.
Howard, J. S., Sparkman, C. R., Cohen, H. G., Green, G., & Stanislaw, H.
of intensive behavior analytic and eclectic treatments for young c
Research in Developmental Disabilities, 26, 359–383.
Hughes, C., Rodi, M. S., Lorden, S. W., Pitkin, S. E., Derer, K. R., Hw
Social interactions of high school students with mental retardati
education peers. *American Journal on Mental Retardation, 104,* 533–
Jacobson, J. W. (1998). Psychological services utilization: Relationship to
problems in intellectual disability services. *Journal of Intellectual Di*
307–315.
Jenkins, R., Rose, J., & Jones, T. (1998). The Checklist of Challengin
relationship with the Psychopathology Inventory for Mentally Reta
of Intellectual Disability Research, 42, 273–278.
Jenkins, R., Rose, J., & Lovell, C. (1997). Psychological well-being o
people who have challenging behaviour. *Journal of Intellectual Di*
502–511.
Jones, E., Felce, D., Lowe, K., Bowley, C., Pagler, J., Gallagher, B., et al.
the dissemination of active support training in staffed community
Journal on Mental Retardation, 106, 344–358.
Jones, E., Perry, J., Lowe, K., Felce, D., Toogood, S., Dunstan, F., et al
and the promotion of activity among adults with severe intellectu
community residences: The impact of staff training in active support.
Disability Research, 43, 164–178.

48, 19–24.
Kishore, M. T., Nizamie, S. H., & Nizamie, A. (2005). The behavioural
disorders in persons with intellectual disability. *Journal of Intellectual D*
852–857.
Klin, A., Pauls, D., Schultz, R., & Volkmar, F. (2005). Three diagnostic ap
syndrome: Implications for research. *Journal of Autism and Develop*
221–234.
Klin, A., Sparrow, S. S., de Bildt, A., Cicchetti, D. V., Cohen, D. J., & Vo
A normed study of face recognition in autism and related disorders. *J*
Developmental Disorders, 29, 499–508.
Koegel, L. K., Camarata, S. M., Valdez-Menchaca, M., & Koegel, R
generalization of question-asking by children with autism. *America*
Retardation, 102, 346–357.
Koegel, R. L., Bimbela, A., & Schreibman, L. (1996). Collateral effects o
family interactions. *Journal of Autism and Developmental Disorders, 2*
Koegel, R. L., Camarata, S., Koegel, L. K., Ben-Tall, A., & Smith, A. (199
intelligibility in children with autism. *Journal of Autism and Develop*
241–251.
Konstantareas, M. M., & Lunsky, Y. J. (1997). Sociosexual knowledge, e
and interests of individuals with autistic disorder and developmen
Autism and Developmental Disorders, 27, 397–413.
Kottorp, A., Bernspang, B., & Fisher, A. G. (2003). Validity of a perfor
activities of daily living for people with developmental disabilities. *J*
Disability Research, 47, 597–605.
Kravits, T. R., Kamps, D. M., Kemmerer, K., & Potucek, J. (2002). Increa
skills for an elementary-aged student with autism using the Picture Ex
tion System. *Journal of Autism and Developmental Disorders, 32,* 225-
Lam, D., Giles, A., & Lavander, A. (2003). Carers' expressed emotion, app
problems and stress in children attending schools for learning di
Intellectual Disability Research, 47, 456–463.
Lambert, N., Nihira, K., & Leland, H. (1993). AAMR Adaptive Behavio
Community. Austin, TX: Pro-Ed.
Lancioni, G. E., O'Reilly, M. F., Campdonico, F., & Mantini, M. (199
sedentariness in task arrangements for people with multiple disabiliti
preferences. *Research in Developmental Disabilities, 19,* 465–475.
Lancioni, G. E., O'Reilly, M. F., Campdonico, F., & Mantini, M. (1998b). T
task repetition for people with profound developmental disabilitie
preferences. *Research in Developmental Disabilities, 19,* 189–199.

Developmental Disorders, 35, 795–805.
Lecavalier, L., Aman, M. G., Hammer, D., Stoica, W., & Mathews, G. L. (2
of the Nisonger Child Behavior Rating Form in children with Autism
Journal of Autism and Developmental Disorders, 34, 709–721.
LeGoff, D. B. (2004). Use of LEGO© as a therapeutic medium for improvi
Journal of Autism and Developmental Disorders, 34, 557–571.
Lerman, P., Apgar, D. H., & Jordan, T. (2005). Longitudinal changes i
of movers and stayers: Findings from a controlled research design. *M*
25–42.
Levitas, A. S., & Reid, C. S. (1998). Rubinstein-Taybi syndrome and
Journal of Intellectual Disability Research, 42, 284–292.
Linuma, K., Minami, P., Cho, K., Kajii, N., & Pachi, N. (1998). Long-term
in the treatment of epilepsy in children with intellectual disability. *J*
Disability Research, 42, 68–73.
Liss, M., Fein, D., Bullard, S., & Robins, D. (2000). Cognitive estimatio
Pervasive Developmental Disorders. *Journal of Autism and Develop*
613–618.
Liss, M., Harel, B., Fein, D., Allen, D., Dunn, M., Feinstein, C., et al. (
correlates of adaptive functioning in children and developmental
Autism and Developmental Disorders, 31, 219–230.
Lord, C., Pickles, A., McLennan, J., Rutter, M., Bregman, J., Folste
Diagnosing autism: Analyses of data from the Autism Diagnostic
Autism and Developmental Disorders, 27, 501–517.
Lowe, K., Felce, D., & Blackman, D. (1996). Challenging behaviour:
specialist support teams. *Journal of Intellectual Disability Research, 4*
Lowe, K., Felce, D., Perry, J., Baxter, H., & Jones, E. (1998). The characte
situations of people with severe intellectual disability and the mo
behaviour in Wales. *Journal of Intellectual Disability Research, 42,* 3
Luckasson, R., Borthwick-Duffy, S., Buntix, W. H. E., Coulter, D. L., Cra
et al. (2002). Mental Retardation: Definition, Classification, and Syste
ed.). Washington, DC: American Association on Mental Retardation
Luiselli, J. K., Campbell, S., Cannon, B., DiPietro, E., Ellis, J. T., Tar
Assessment instruments used in the education and treatment of perso
report of a survey of national service centers. *Research in Developm*
389–398.
Luscre, D. M., & Center, D. B. (1996). Procedures for reducing dental
autism. *Journal of Autism and Developmental Disorders, 26,* 547–556.

meaningful activity and "active support" of people with intellectual d
tial care. *Research in Developmental Disabilities, 23,* 342–352.
Matson, J. L. (1995). Matson evaluation of social skills for individuals wit
Baton Rouge, LA: Scientific Publishers.
Matson, J. L., Bielecki, J., Mayville, E. A., Smalls, Y., Bamburg, J. W., &
The development of a reinforcer choice assessment scale for pers
profound mental retardation. *Research in Developmental Disabilities,*
Matson, J. L., Carlisle, C. B., & Bamburg, J. W. (1998). The convergent va
Evaluation of Social Skills for Individuals with Severe Retardation (M
in Developmental Disabilities, 19, 493–500.
Matson, J. L., Dixon, D. R., Matson, M. L., & Logan, J. R. (2005)
retardation and specific strength and deficit areas in severe and
retarded persons with the MESSIER. *Research in Developmental Disa*
Matson, J. L., Mayville, S. B., & Laud, R. B. (2003). A system of asse
behavior, social skills, behavioral function, medication side-effe
disorders. *Research in Developmental Disabilities, 24,* 75–81.
Matson, J. L., Rush, K. S., Hamilton, M., Anderson, S. J., Bamburg, J.
(1999). Characteristics of depression as assessed by the Diagnostic
Severely Handicapped-II (DASH-II). *Research in Developmental Disa*
Matson, J. L., & Smiroldo, B. B. (1997). Validity of the mania subsca
Assessment for the Severely Handicapped-II (DASH-II). *Researc*
Disabilities, 18, 221–225.
Mazzocco, M. M. M., Baumgardner, T., Freund, L. S., & Reiss, A. L. (1998
among girls with Fragile X or Turner syndrome and their sisters. *Jo*
Developmental Disorders, 28, 509–517.
McCarron, M., Gill, M., Lawlor, B., & Beagly, C. (2002). A pilot study
validity of the Caregiver Activity Survey – Intellectual Disability (
Intellectual Disability Research, 46, 605–612.
McCarthy, J., & Boyd, J. (2001). Psychopathology and young people wit
Childhood predictors and adult outcome of disorder. *Journal of I*
Research, 45, 99–105.
McCarthy, J., & Boyd, J. (2002). Mental health services and young peo
disability: Is it time to do better? *Journal of Intellectual Disability Res*
McDermott, S., Martin, M., Weinrich, M., & Kelly, M. (1999). Program
education curriculum for women with mental retardation. *Researc*
Disabilities, 20, 93–106.
McIntyre, L. L., Blacher, J., & Baker, B. L. (2002). Behaviour/mental healt
adults with intellectual disability: The impact on families. *Journal of I*
Research, 46, 239–249.

Moss, S., & Patel, P. (1997). Dementia in older people with intellectual dis
physical and mental illness, and levels of adaptive behavior. *Journal of*
Research, 41, 60–69.
Moss, S., Prosser, H., Costello, H., Simpson, N., Patel, P., Rowe, S., et al. (
validity of the PAS-ADD Checklist for detecting psychiatric disc
intellectual disability. *Journal of Intellectual Disability Research, 42,*
Mount, R. H., Charman, T., Hastings, R. P., Reilly, S., & Cass, H. (2003
in Rett syndrome and severe mental retardation. *Journal of Autism*
Disorders, 33, 435–442.
Mudford, O. C., Cross, B. A., Breen, S., Cullen, C., Reeves, D., Gould, J., e
integration training for children with autism: No behavioral benefit
Journal on Mental Retardation, 105, 118–129.
Murphy, G., Hall, S., Oliver, C., & Kissi-Debra, R. (1999). Identification
behavior in young children with intellectual disability. *Journal of*
Research, 43, 149–163.
Nachshen, J. S., Woodford, L., & Minnes, P. (2003). The Family Stress and
families of individuals with developmental disabilities: A lifespan p
adjustment. *Journal of Intellectual Disability Research, 47,* 285–290.
Niccols, A., Atkinson, L., & Pepler, D. (2003). Mastery motivation in
Down's syndrome: Relations with cognitive and adaptive compete
lectual Disability Research, 47, 121–133.
Nihira, K., Leland, H., & Lambert, N. (1993). AAMR Adaptive Behavior S
Community Version (2nd ed.). Austin, TX: Pro-Ed.
Njardvik, U., Matson, J. L., & Cherry, K. E. (1999). A comparison of soci
autistic disorder, pervasive developmental disorder not otherwise s
retardation. *Journal of Autism and Developmental Disorders, 29,* 287-
Oliver, C., Crayton, L., Holland, A., & Hall, S. (2000). Cognitive deteric
Down syndrome: Effects on the individual, caregivers, and service use
Mental Retardation, 105, 455–465.
Oliver, C., Demetriades, L., & Hall, S. (2002). Effects of environmental e
laughing behavior in Angelman syndrome. *American Journal on Me*
194–200.
Oliver, C., Hall, S., & Murphy, G. (2005). The early development of self
Evaluating the role of social reinforcement. *Journal of Intellectual D*
591–599.
Oliver, C., Holland, T., Hall, S., & Crayton, L. (2005). Effects of increasing
impairment in adults with Down syndrome. *American Journal on Me*
339–345.

Owen, D. M., Hastings, R. P., Noone, S. J., Chinn, J., Harman, K., Rob
Life events as correlates of problem behavior and mental health in a r
of adults with developmental disabilities. *Research in Developme*
309–320.

Ozonoff, S., Cook, I., Coon, H., Dawson, G., Joseph, R. M., Klin, A., et al.
on Cambridge Neuropsychological Test Automated Battery subtest
lobe function in people with Autistic Disorder: Evidence from the Co
of Excellence in Autism network. *Journal of Autism and Developm*
139–150.

Panerai, S., Ferrante, L., & Zingale, M. (2002). Benefits of the Treatme
Autistic and Communication Handicapped Children (TEACCH) prog
with a non-specific approach. *Journal of Intellectual Disability Resear*

Paul, R., Augustyn, A., Klin, A., & Volkmar, F. R. (2005). Perception
prosody by speakers with Autism Spectrum Disorders. *Journal of*
mental Disorders, 35, 205–220.

Paul, R., Miles, S., Cicchetti, D., Sparrow, S., Klin, A., Volkmar, F., et
behavior in autism and pervasive developmental disorder-not otherw
analysis of scores on the Vineland Adaptive Behavior Scales. *Jou*
Developmental Disorders, 34, 223–228.

Paul, R., Shriberg, L. D., McSweeny, J., Cicchetti, D., Klin, A., & Volkmar
between prosodic performance and communication and socialization
tioning speakers with Autism Spectrum Disorders. *Journal of Autism*
Disorders, 35, 861–869.

Perry, A., Condillac, R. A., Freeman, N. L., Dunn-Geier, J., & Belair, J. (20
of the Childhood Autism Rating Scale (CARS) in five clinical group
Journal of Autism and Developmental Disorders, 35, 625–634.

Perry, J., & Felce, D. (2005a). Correlation between subjective and objective
in staffed community housing. *Journal of Intellectual Disability Resea*

Perry, J., & Felce, D. (2005b). Factors associated with outcome in comm
American Journal on Mental Retardation, 110, 121–135.

Pogson, D. (1997). Issues for consideration in dihydropteridine reductase
A variant form of hyperphenylaninaemia. *Journal of Intellectual Dis*
208–214.

Pollingue, A. (1987). Adaptive behavior and low incidence handicap
behavior instruments for persons with physical handicaps. *The Journal*
21, 117–125.

Prasher, V. P., Chung, M. C., & Haque, M. S. (1998). Longitudinal changes
in adults with Down syndrome: Interim findings from a longitudi
Journal on Mental Retardation, 103, 40–46.

disabilities. *Journal of Intellectual Disability Research, 42,* 264–272.
Pruchno, R. A., & McMullen, W. F. (2004). Patterns of service utilizat
developmental disability: Type of service makes a difference. *Americ*
Retardation, 109, 362–378.
Reschly, D. J., Myers, T. G., & Hartel, C. R. (2002). Mental Retardation: I
ty for Social Security Benefits. Washington, D.C.: National Academ
Rellini, E., Tortolani, D., Trillo, S., Carbone, S., & Montecchi, F. (2004
Rating Scale (CARS) and Autism Behavior Checklist (ABC) corresp
with DSM-IV criteria in diagnosis of autism. *Journal of Autism*
Disorders, 34, 703–708.
Ricci, L. A., & Hodapp, R. M. (2003). Fathers of children with Down's sy
types of intellectual disability: Perceptions, stress and involvement. J
Disability Research, 47, 273–284.
Richards, D. F., Williams, W. L., & Follette, W. C. (2002). Two new empir
to use the Assessment of Basic Learning Abilities. *American Journal o*
107, 329–339.
Roberts, J. E., Mirrett, P., & Burchinal, M. (2001). Receptive and expre
development of young males with Fragile X syndrome. *America*
Retardation, 106, 216–230.
Robertson, J., Emerson, E., Gregory, N., Hatton, C., Kessissoglou, S., &
Receipt of psychotropic medication by people with intellectual di
settings. *Journal of Intellectual Disability Research, 44,* 666–676.
Robertson, J., Emerson, E., Pinkney, L., Caesar, E., Felce, D., Meek, A.,
and costs of community-based residential supports for people with m
challenging behavior. *American Journal on Mental Retardation, 109,*
Robertson, J., Emerson, E., Pinkney, L., Caesar, E., Felce, D., Meek, A., et
and management of challenging behaviours in congregate and nonco
based supported accommodation. *Journal of Intellectual Disability R*
Rogers, S. J., Hepburn, S., & Wehner, E. (2003). Parent reports of sensory
with autism and those with other developmental disorders. *Journal o*
mental Disorders, 33, 631–642.
Rogers, T., Kalaydjieva, L., Hallmayer, J., Petersen, P. B., Nicholas, P., Pir
Exclusion of linkage to the HLA region in ninety multiplex sibships w
Autism and Developmental Disorders, 29, 195–201.
Rojahn, J. (1986). Self-injurious behavior and stereotypic behavior in
mentally retarded people. *American Journal of Mental Deficiency, 91*
Romski, M. A., Sevcik, R. A., & Adamson, L. B. (1999). Communication p
mental retardation with and without their speech-output communicat
Journal on Mental Retardation, 104, 249–259.

autism: Four-year outcome and predictors. *American Journal on Men*
417–438.
Saloviita, T., Itälinna, M., & Leinonen, E. (2003). Explaining the parental
mothers caring for a child with intellectual disability: A Double ABC
Intellectual Disability Research, 47, 300–312.
Schwartz, C., & Rabinovitz, S. (2003). Life satisfaction of people with i
living in community residences: Perceptions of the residents, the
members. *Journal of Intellectual Disability Research, 47,* 75–84.
Schupf, N., Zigman, W., Kapell, D., Lee, J. H., Kline, J., & Levin, B. (199
in women with Down's syndrome. *Journal of Intellectual Disability R*
Seal, B. C., & Bonvillian, J. D. (1997). Sign language and motor functior
autistic disorder. *Journal of Autism and Developmental Disorders, 27,*
Sicotte, C., & Stemberger, R. M. T. (1999). Do children with PDDNOS ha
Journal of Autism and Developmental Disorders, 29, 225–233.
Silverman, W., Schupf, N., Zigman, W., Devenny, D., Miezejeski, C., Schu
Dementia in adults with mental retardation: Assessment at a single po
Journal on Mental Retardation, 109, 111–125.
Simon, E. W., Rosen, M., & Ponpipom, A. (1996). Age and IQ as pr
identification in adults with mental retardation. *Research in Develo*
17, 383–389.
Simpson, N. (2003). Delirium in adults with intellectual disabilities and
Intellectual Disability Research, 47, 38–42.
Skinner, D. G., Correa, V., Skinner, M., & Bailey, D. B. Jr. (2001). Role of r
latino families of young children with developmental delays. *America*
Retardation, 106, 297–313.
Smith, C., Felce, D., Ahmed, Z., Fraser, W. I., Kerr, M., Kiernan, C., et
effects on responsiveness: Evaluating the reduction of antipsychotic r
with intellectual disability using a conditional probability approach. *J*
Disability Research, 46, 464–471.
Smith, C., Felce, D., Jones, E., & Lowe, K. (2002). Responsiveness to staff
the impact of individual characteristics on the effectiveness of act
using a conditional probability approach. *Journal of Intellectual Dis*
594–604.
Smith, E. A., & Van Houten, R. (1996). A comparison of the characteristi
behaviors in "normal" children and children with developmental
Developmental Disabilities, 17, 253–268.
Smith, T., Eikeseth, S., Klevstrand, M., & Lovaas, O. I. (1997). Intensive
of preschoolers with severe mental retardation and pervasive deve
American Journal on Mental Retardation, 102, 238–249.

(Ed.), Adaptive Behavior and Its Measurement: Implications for
Retardation. Washington, DC: AAMR.
Spreat, S., & Conroy, J. (2002). The impact on deinstitutionalization on fan
in Developmental Disabilities, 23, 202–210.
Spreat, S., Conroy, J., & Fullerton, A. (2005). A cost–benefit analysi
institutional placements for persons with mental retardation in Ok
Developmental Disabilities, 26, 17–31.
Spreat, S., Conroy, J., & Rice, D. M. (1998). Improve quality in nursin
community placement? Implementation of OBRA for individuals wit
Research in Developmental Disabilities, 19, 507–518.
Stancliffe, R. J., Abery, B. H., & Smith, J. (2000). Personal control and the e
living settings: Beyond living-unit size and type. *American Journal or*
105, 431–454.
Stancliffe, R. J., & Hayden, M. F. (1998). Longitudinal study of institution
on individuals who remain in the institution. *American Journal on Me*
500–510.
Stancliffe, R. J., Hayden, M. F., Larson, S. A., & Lakin, K. C. (2002). Long
adaptive and challenging behaviors of deinstitutionalized adults wit
American Journal on Mental Retardation, 107, 302–320.
Stancliffe, R. J., & Lakin, K. C. (1998). Analysis of expenditures and ou
alternatives for persons with developmental disabilities. *American*
Retardation, 102, 552–568.
Starr, E., Szatmari, P., Bryson, S., & Zwaigenbaum, L. (2003). Stability and
functioning children with Pervasive Developmental Disorders: A 2
Journal of Autism and Developmental Disorders, 33, 15–22.
Stella, J., Mundy, P., & Tuchman, R. (1999). Social and nonsocial facto
Autism Rating Scale. *Journal of Autism and Developmental Disorders*
Stephens, D. L., Collins, M. D., & Dodder, R. A. (2005). A longitudinal
and skill acquisition among individuals with developmental disabiliti
opmental Disabilities, 26, 469–486.
Stone, W. L., Ousley, O. Y., Hepburn, S. L., Hogan, K. L., & Brown, C.
adaptive behavior in very young children with autism. *American Jou*
dation, 104, 187–199.
Sudhalter, V., & Belser, R. C. (2001). Conversational characteristics of ch
syndrome: Tangential language. *American Journal on Mental Retard*
Szatmari, P., Archer, L., Fisman, S., & Streiner, D. L. (1994). Parent and
the assessment of pervasive developmental disorders. *Journal of Autis*
Disorders, 24, 703–717.

SMC(15) and paternal uniparental disomy: A case report with referen
of cognitive functioning and autistic symptomatology. *Journal of A*
mental Disorders, 33, 171–176.
Tombokan-Runtukahu, J., & Nitko, A. J. (1992). Translation, cultural adj
tion of a measure of adaptive behavior. *Research in Developmental Dis*
Tsatsanis, K. D., Dartnall, N., Cicchetti, D., Sparrow, S. S., Klin, A., & Vo
Concurrent validity and classification accuracy of the Leiter and Leiter-
children with autism. *Journal of Autism and Developmental Disorders,*
Turk, J., & Cornish, K. (1998). Face recognition and emotion perception in
syndrome. *Journal of Intellectual Disability Research, 42,* 490–499.
Turner, W. D., Realon, R. E., Irvin, D., & Robinson, E. (1996). The effe
program consequences with a group of individuals who engaged in
hand mouthing. *Research in Developmental Disabilities, 17,* 311–330.
Udwin, O., Howlin, P., Davies, M., & Mannion, E. (1998). Community
Williams syndrome: How families cope and the availability of support
Intellectual Disability Research, 42, 238–245.
Urv, T. K., Zigman, W. B., & Silverman, W. (2003). Maladaptive behavior
decline in aging adults with mental retardation. *American Journal on*
108, 327–339.
Van Bourgondien, M. E., Reichle, N. C., Campbell, D. G., & Mesibov
Environmental Rating Scale (ERS): A measure of the quality of the res
for adults with autism. *Research in Developmental Disabilities, 19,* 39
Van Bourgondien, M. E., Reichle, N. C., & Schopler, E. (2003). Effects o
approach on adults with autism. *Journal of Autism and Developm*
131–140.
VanMeter, L., Fein, D., Morris, R., Waterhouse, L., & Allen, D. (1997). D
in autistic social behavior. *Journal of Autism and Developmental Diso*
Veltman, M. W. M., Thompson, R. J., Craig, E. E., Dennis, N. R., Rober
Browne, J. A., & Bolton, P. F. (2005). A paternally inherited duplic
Willi/Angelman syndrome critical region: A case and family study. *J*
Developmental Disorders, 35, 117–127.
Verri, A., Uggetti, C., Vallero, E., Ceroni, M., & Federico, A. (2000). Ora
patient with rhombencephalosynapsys. *Journal of Intellectual Disability*
Voelker, S., Shore, D., Hakim-Larson, J., & Bruner, D. (1997). Discrepa
teacher ratings of adaptive behavior of children with multiple disabili
tion, 35, 10–17.
Wall, M. E., & Gast, D. L. (1999). Acquisition of incidental information d
a response-chain skill. *Research in Developmental Disabilities, 20,* 31–

Weber, A. M., Egelhoff, J. C., McKellop, J. M., & Franz, D. N. (20
cerebellum: Evidence from tuberous sclerosis. *Journal of Autism*
Disorders, 30, 511–517.

Weiss, J., Diamond, T., Demark, J., & Lovald, B. (2003). Involvement in
its relations to self-concept and actual competency in participants
disabilities. *Research in Developmental Disabilities, 24,* 281–305.

Werner, E., Dawson, G., Munson, J., & Osterling, J. (2005). Variation in
course in autism and its relation with behavioral outcome at 3–4
of Autism and Developmental Disorders, 35, 337–350.

Werner, E., Dawson, G., Osterling, J., & Dinno, N. (2000). Recognition
Disorder before one year of age: A retrospective study based on hom
of Autism and Developmental Disorders, 30, 157–162.

Wetherby, A. M., Woods, J., Allen, L., Cleary, J., Dickinson, H., & L
indicators of Autism Spectrum Disorders in the second year of life.
Developmental Disorders, 34, 473–493.

Williams, K. C. (1996). Piagetian principles: Simple and effective applica
lectual Disability Research, 40, 110–119.

Williams, K. R., Wishart, J. G., Pitcairn, T. K., & Willis, D. S. (2005). En
children With Down syndrome: Investigation of specific impairmen
American Journal on Mental Retardation, 110, 378–392.

Wilson, C., Seaman, L., & Nettlebeck, T. (1996). Vulnerability to crimin
ence of interpersonal competence differences among people with
Journal of Intellectual Disability Research, 40, 8–16.

Yalon-Chamovitz, S., & Greenspan, S. (2005). Ability to identify, explain
everyday tasks: Preliminary validation of a direct video measure of
Research in Developmental Disabilities, 26, 219–230.

Young, L., & Ashman, A. F. (2004). Deinstitutionalization for older adu
retardation: Results from Australia. *American Journal on Ment*
397–412.

Zanolli, K., Daggett, J., & Adams, T. (1996). Teaching preschool age aut
spontaneous initiations to peers using priming. *Journal of Autism*
Disorders, 26, 407–422.

Zappella, M., Gillberg, C., & Ehlers, S. (1998). The preserved speech varia
Rett complex: A clinical report of 30 cases. *Journal of Autism and Dev*
28, 519–526.

Zarcone, J. R., Crosland, K., Fisher, W. W., Worsdell, A. S., & Herma
method for conducting a negative-reinforcement assessment. *Resea*
Disabilities, 20, 107–124.

Pervasive Developmental Disorder and complex chromosome rear
8p and 10p. *Journal of Autism and Developmental Disorders, 35,* 393–
Zwaigenbaum, L., Szatmari, P., Mahoney, W., Bryson, S., Bartolucci, G., &
High functioning autism and Childhood Disintegrative Disorder in h
of Autism and Developmental Disorders, 30, 121–126.

TEXAS AT AUSTIN, AUSTIN, TEXAS

BONNIE O'REILLY

GULLETT ELEMENTARY SCHOOL, AUSTIN INDEPEND
SCHOOL DISTRICT, AUSTIN, TEXAS

JEFF SIGAFOOS AND VANESSA GREEN

DEPARTMENT OF EDUCATION, UNIVERSITY OF TASMANIA
TASMANIA, AUSTRALIA

GIULIO LANCIONI

DEPARTMENT OF PSYCHOLOGY, UNIVERSITY OF BARI, BA

WENDY MACHALICEK

DEPARTMENT OF SPECIAL EDUCATION, THE UNIVERSITY OF TE
AUSTIN, TEXAS

I. INTRODUCTION

Educational assessment is a vital component of the educa
students with intellectual disabilities. Assessment is used w
sions regarding educational placement, developing curricu

0074-7750/07 $35.00
DOI: 10.

ments such as IQ tests can be used to assess the child's lev
functioning. Some popular tests of intellectual functioning in
Scales of Infant Development II (Bayley, 1993) and the Stanf
gence Scales (fifth edition) (Roid, 2003). Criterion-refere
as the Adaptive Behavior Scale-School (second edition) (La
Leland, 1993) and the Vineland Adaptive Behavior Scales
& Cicchetti, 1984) compare the student's levels of adaptiv
communication, social skills, daily living skills) to a predet
mastery for a particular chronological age. Norm-reference
referenced tests are described in great detail in Chapters 2 a
and will not be discussed further in the current chapter.

The other major purpose of educational assessment revo
development and evaluation of a student's curriculum. This ty
assessment is usually called an *informal* or *functional* assessm
assessment is coordinated by the student's teacher(s). Inform
in a systematic manner from relevant others such as parents, p
and from other professionals such as occupational therapists, s
and psychologists. The student is also observed in relevant sch
(e.g., in the resource classroom, in the regular classroom, dur
community settings such as the grocery store). This system
information-gathering process is used to identify functional
skills that can be translated into a curriculum. The skills ident
should be objective and measurable which allows for ongoi
student progress throughout the academic year.

In this chapter we will focus on the process of conductin
functional assessment of the student's environment in orc
curriculum that is amenable to ongoing evaluation.

II. LEGISLATION AND EDUCATIONAL ASSESS

Educational assessment in public schools is profoundl
legal requirements that have been enacted in legislation.
with Disabilities Education Act (IDEA, 1990; IDEA Am

tive educational environment; (f) access to the general educ
and (g) student involvement in the creation of the individu
plan (IEP). Of specific interest are the guidelines that IDE
regard to the development and evaluation of curricula for th

If tests of IQ or adaptive behavior scales are used they mus
natory on a racial or cultural basis. Additionally, tests must b
the child's native language or primary mode of communica
not feasible. The tests used must be valid and administe
instructions by a trained professional. A variety of assessm
used to determine appropriate educational placement an
student's curriculum. Educational placement decisions can
the basis of a single test.

Students with disabilities are entitled to an individualize
(IEP). This means that the educational goals for a student m
on an individual basis and must reflect the unique educati
student. The IEP is developed by a team of individuals inclu
educational professionals. Parents should play a central
process. Other key individuals involved in the process in
educator, regular educator, and other disciplines that will b
monitoring and delivery of the program. As the studen
makeup of this IEP team will change with the changing e
of the student. For example, transition specialists or voca
tion specialists will become involved once the student reac
this point the student should begin to prepare for adult life

Educational goals of the IEP should be objective and m
ongoing basis in order to determine whether the student
goals. Educators are required to use tools and strategies t
mining whether the student's educational needs are being
the IEP goals must be amenable to continuous assessmen
specifically requires that ongoing data be generated in th
that this data should inform decision-making of the educa
student's educational goals are typically evaluated on an
the team, including the parents. At this annual meeting
goals are determined and earlier goals may be revised if th

relatively recent developments in person-centered approach
(O'Brien, O'Brien, & Mount, 1997), effective and efficient st
choice and preference (Cannella, O'Reilly, & Lancioni, 200
emphasis on self-determination (Wehmeyer & Sands, 199
severe and multiple disabilities should have some level of inv
own assessment process. We will discus these assessment stra
later sections of the chapter.

IDEA stipulates that the student's education should oc
restrictive environment. This means that to the maximum e
student should be educated with nondisabled peers. The la
lates that removal from the regular classroom should o
students cannot succeed in the regular classroom even with
and support services. Furthermore, IDEA also requires that
ipate to some degree in the general curriculum and that statev
are adapted to assess performance on this curriculum. Acce
curriculum by students with intellectual disabilities is also re
Child Left Behind Act (2001). These legislative requirement
meters with regard to IEP objectives and assessment strateg
be made to adapt educational goals from the regular curricu
ful ways for students with intellectual disabilities. Additio
assessment strategies must be adapted to incorporate reg
goals within ecological or functional assessments.

Finally, IDEA identifies procedures for the assessment
students with intellectual disabilities who engage in challe
As many as 20% of individuals with intellectual disabilities
viors such as property destruction, self-injury, and aggre
Arthur, & O'Reilly, 2003). Schools are required to cond
behavioral assessment of the student's challenging behavio
a behavioral support plan based on the results of this a
important to note here that functional assessment has a very
when it comes to dealing with challenging behavior. Funct
of challenging behavior describes a series of assessment
are designed to identify what may be influencing a stude

assessment that is congruent with the assessment paramet
this current legislation.

III. THE PROCESS OF ASSESSMENT

As mentioned previously, informal or functional ass
ducted for two major reasons. First, such assessments are
educational goals for the student for the upcoming
In other words the student's curriculum is determined via
Second, student performance is continuously assessed dur
year to ensure he or she is making adequate progress tow
tional goals. The major steps of educational assessment ar
following sections.

A. Determining the Student's Current Strengths

The first step of any educational assessment is to get
comprehensive picture of the student's current levels of p
students with intellectual disabilities it is important to asc
within academic, leisure, domestic, and community domai
of call for this information is to interview the previous teac
the student's IEP from the previous year. The IEP will out
educational goals and instructional objectives. It is usua
review what educational goals were targeted in the IEP,
met, and what instructional objectives remain to be achi
no means saying that educational goals from a previou
automatically transferred to a current IEP. However, it ma
discussing previous IEP goals with parents and previous t
mine whether they might be continued in the current IE
helpful to review formal assessment results (i.e., IQ and a
assessments) to get an overall view of the student's intellect
functioning. This information can be helpful in determin

It is a legal requirement that parents be involved in develo
their son or daughter. Specifically, parents should be present
meeting to provide input about educational goals and to app
of the IEP. This process can sometimes be daunting for pa
feel uncomfortable expressing their opinions among a group
It is important that interviewers place the parents at ease. T
assessment process is invaluable. Also, instructional program
should span school, community, and family environments. In
made within a school environment may ultimately prove futile
working on these same goals with their child (Snell & Brown
and Fox (2004) offer a set of guidelines for interviewing par
These guidelines should enhance a respectful and productive
most families.

The purpose of this initial interview(s) is to determine the
in terms of educational goals for their child. It may be helpfu
to meet individually with the parents prior to the IEP mee
establish a trusting relationship and to inform parents of the
the educational planning process. Parents can be prepared
subsequent IEP meeting with a list of educational goals tha
addressed for the upcoming academic year.

Several strategies for planning the educational goals o
intellectual disabilities have been proposed during the la
[Westling and Fox (2004) for a detailed review of these pr
tively, these strategies are typically called Person-Centered
the more popular person-centered planning approaches i
Futures Planning (Mount & Zwernik, 1988); the McGill
System (Vandercook, York, & Forest, 1989); and Choosi
Accommodations for Children (Giangreco, Cloninger, & Iv

While each of these person-centered planning approa
among a number of dimensions, they have a number of cor
acteristics. The person with intellectual disabilities is central,

arrange child care for their child or children during the time of th

5. Avoid using professional jargon and displaying an air of arrogan for the parents and be very open to their thoughts and opinions talk.
6. Arrive on time for scheduled meetings and only stay for a reasc time, usually no more than an hour.

Source: Westling and Fox (2004), Figure 6–1.

FIG. 1. Suggestions for interviewing parents.

they are actively involved, in all planning meetings. If the abilities is unable to communicate for himself, a friend or re to interpret the person's wants and needs will facilitate comm the meetings. A series of meetings and not a single meeting group to develop an initial person-centered plan. In addition typically required to attend IEP meetings the individual's should also be present. This circle of friends includes inc fellow students, additional family members such as grandp individuals who have personal and ongoing involvement The meetings then revolve around who the individual is (i.e., family, the classroom, among peers, in the community). Each or goals for the individual are shared. The barriers to achievi discussed. Strategies for overcoming these barriers for ach goals are then identified by the group.

of widespread uptake of person-centered planning might b
time-consuming process.

C. Incorporating Student Preference and Choice

Actively involving students with intellectual disabilities in
instructional, and evaluation process of their own educatio
agenda both in current educational legislation and in the s
professional literature (Snell & Brown, 2006; Wehmeyer
In fact, the person-centered planning process outlined in the
places the student at center stage when determining IEP go
are to involve students in determining their own IEP goals a
their own progress then strategies for acknowledging studen
incorporating student choice making must be included in the
important to clarify what is meant by choice and preferen
activity or behavior of engaging with an item, activity, or se
is said to be present when someone consistently chooses an
setting. Choice and preference are therefore inextricably link
vehicle through which preferences are expressed.

While many students with intellectual disabilities are ca
their own choices, other students with more severe disabiliti
limited communication skills. This condition should not
students from active involvement in the assessment process
a wealth of empirical literature that has documented a va
assessment strategies for determining choice and preference
severe disabilities (Cannella, O'Reilly, & Lancioni, 2005; La
& Emerson, 1996). Teachers should be familiar with
such assessment protocols to help determine IEP goals and
instructional strategies. Choice and preference assessm
incorporated on an ongoing basis throughout the academi
students to give them continuous opportunities to make
identify new preferred items or activities. Additionally, perso
profound multiple disabilities are capable of making c

multiple disabilities appear happier when they have the
make choices and engage in preferred activities or with
(Lancioni, O'Reilly, Compodonico, & Mantini, 1998; Lanc
Oliva, 2002). Challenging behavior can be reduced when s
opportunities to make choices and engage in preferred ac
et al., 2005). Finally, active student involvement and stu
seem to increase when students have the opportunity to
preferred activities (e.g., Hughes, Pitkin, & Lorden, 1998).

A number of choice assessment strategies are present
to selecting any of these strategies the teacher should hav
standing of how the student indicates choice versus avoida
versus negative emotions. This information can be obtain
the student over an extended period of time and/or inte
and significant others. Approach responses can include s
moving toward an item, looking at the item consistent
item, and so on. Avoidance responses may include such
paying attention to the item, actively pushing the item awa
from the item, and so on. Positive affect might include s
smiling, giggling, and positive noises (as reported by sig
Negative affect might include crying, screaming, moaning, c
(as reported by significant others). Items that are consiste
and are associated with positive affect may be considered
These behaviors can be assessed systematically across dif
activities to gain a comprehensive picture of the items, settin
are preferred by the student. Additionally, assessments need
in natural classroom or community settings (i.e., where the
during the academic year) and the stimuli or activities to be
be age-appropriate and reflect appropriate educational obj

Probably the simplest and most efficient assessment pro
preferred items for students with severe disabilities is the brie
ence assessment developed by Roane, Vollmer, Ringdahl, a
First, a series of items (~10 items) are identified that are
preferred via interviews with parents, previous teachers, and

access of the student. The student then has the opportunity t
items as she or he so wishes for 5 min. Every 10 sec during the
teacher should record what items the student is manipulatin
ferred items would be the top three or four most manipulated
assessment. This simple assessment can be used to identif
preferred at the IEP planning stage. Additionally, this typ
could be used on a weekly basis during the school year to id
student preferences.

To assess preference for activities or settings it is necess
student in a setting or engage the student in the task and the
observe their levels of engagement and indices of happ
O'Reilly, and Moon (1993) assessed preference for suppor
opportunities with four transition-aged students with au
intellectual disabilities (janitorial, house keeping, dish was
Prior to the assessment the authors identified how each of
expressed positive and negative affect by interviewing pare
and by observing each of the students when they were engag
leisure activities (which presumably would be associated wi
positive affect). Each of the students was observed on a num
as they performed each of the three jobs. Student preferenc
jobs was determined by measuring their levels of positiv
positive noises) and negative (e.g., hand biting, crying) af
formed each of the jobs. Each of the three students demon
cratic preferences. Such systematic assessments could als
for classrooms tasks (academic, leisure) or instructional for
versus group instruction).

When evaluating the results of preference assessments o
tasks, the teacher should consider possible setting events
temporarily altered the student's performance. For instan
has been placed on a higher dose of seizure medication a
before the preference assessment, the student may be mor
usual and could have dampened, or unusual responses.

teacher will have the opportunity to access the results of
from the student's file. The educational psychologist will be
the teacher to the adaptive behavior assessment and explai

Adaptive behavior scales are designed to provide a gene
student's levels of performance in many major areas of da
the areas that are typically assessed using adaptive behavi
daily living skills, social skills, motor skills, and communi
adaptive behavior scales can give a general impression of a
performance (relative to nondisabled students of his or he
can be help guide discussion of IEP objectives. For exampl
perform well on communication skills but may possess very
There may therefore be a need to place more emphasis o
skills goals for instruction over communication skills goals
academic year.

Some adaptive behavior scales such as the Vineland A
Scales (Sparrow et al., 1984) are very specific in terms of iden
that the student can and cannot do in the various domai
(e.g., daily living, communication, and social skills). It ma
suggest specific skills for instruction within each of the perfo
based on a review of the student's performance on the V
Behavior Scales. On the other hand, adaptive behavior scale
helpful in terms of identifying instructional objectives with s
found multiple disabilities. These students may be functioning
that these scales may pick up very little in terms of their funct
in a flat performance profile across all performance domains

There are a variety of commercially available curriculu
skills guides that may be worthwhile consulting when devel
tives. Similar to our discussion of the adaptive behavior sc
guides might be helpful in prompting the team, including p
and other members to select functional age-appropriate goa
For example, Wilcox and Bellamy (1987) published an acti

for age-appropriate functional goals for students with sev
disabilities.

E. Conducting an Ecological Assessment

One of the most popular and enduring forms of functio
that of the ecological inventory. This process of assessment w
seminal paper by Brown et al. (1979) and continues to be wide
method of informal assessment for students with intellectual
& Brown, 2006; Westling & Fox, 2004). Ecological asse
involves the identification of the major environments in w
will function in the upcoming academic year. The skills that t
required to perform in those environments are identified and
tasks that are prioritized are then included as IEP goals f
academic year. This assessment process ensures that func
selected for instruction. The reason for this is that the ass
begins with identifying real world environments and then cl
the student needs to independently function in such environ
all students (especially those with more severe disabilities) w
independently function in many of these environments.
process does identify functional and age-appropriate skill
students can participate with proper support.

In the last section we suggested that curriculum-based
adaptive behavior scales might serve a similar purpose a
inventory (i.e., identification of functional and age-appro
significant advantage of the ecological inventory over lis
activities is that it actually involves systematically observin
each of the targeted environments to develop an individu
of that student's strengths and needs in each particular settin
the ecological inventory is more flexible than, for example, a
(Wilcox & Bellamy, 1987), which outlines a predetermine
mance expectancies in each environment (i.e., work, leisu
and so on).

be seen as supplements to an ecological inventory.

An ecological inventory begins with identifying a numb functioning for the student. These domains should include ments in which the student currently functions or will functio academic year. These domains usually include school, leisu vocational. There is some flexibility with regard to the do assessment. For example, the vocational domain would not young child. Once domains are selected for a student, the involves a process of teasing out critical environments in th critical activities within these environments and the skills re those activities. The assessment involves a five-step process:

1. Identify the core performance domains
2. Identify the environments in each of the domains
3. Divide the environments into subenvironments
4. Identify the critical activities within each subenvironn
5. Assess student performance on each of the critical ski

These five steps of an ecological assessment are outlined sections. An example of using the ecological assessment fo severe disabilities is incorporated to help clarify the proces

Step 1: Identify the core domains. The core domains i activities and/or environments in which a person functio earlier, not all domains may be as relevant to a student at time in their lives. At any point in time in a person's life so be more important than others. Prior to an ecological assess come to an agreement as to what domains should be include assessment and what domains may have priority. This ta selecting, and prioritizing life domains can be complete person-centered planning process.

Example: *Shane is a 10-year-old boy with severe disabilitie attending fifth grade at a regular elementary school in a large southwest United States. He is ambulatory but is confined to*

centered planning process included enhancing Shane's commun
increasing his overall skills/participation during leisure activit
selected for ecological assessment for Shane for the upcomi
included Leisure/recreation, School, Community, and Domestic

Step 2: Identify the environments within each domain. The ecological assessment is to identify the environments within which the student learns, plays, and lives. This should not search of all environments in each domain. Again, the stude family should agree on core environments within each do allow for a clearer focus on instructional needs and supports will require later in the process within each domain.

Example: The environments within each domain are outlin Shane. There are more environments included under the L domain than in the other domains. This emphasis on leisure reflects the agenda of the previous person-centered plan for Sh overlap, with some environments included in several domain ments overlap across domains it means that these are prioritie instruction and support for the student. These environmen particular emphasis when developing IEP goals and objective

TABLE I

CORE DOMAINS AND ENVIRONMENTS WITHIN EACH DOMA

Core domains	Leisure/recreation	School	Domestic
Environments	Joe's restaurant	Ridge River Elementary School	Home
	YMCA		Grandmother' home
	Louie's go-carts, pizza and more		
	Home		
	Ridge River Elementary School		

Bathroom Bathroom

Step 3: Divide the environments into subenvironments. The to take each environment identified and break it into subenv subenvironment will reflect a particular set of skills or activit student to participate or function independently.

Example: The subenvironments for each of the leisure enviro fied in Table II for Shane. For example, Shane goes to Joe's week with his dad and a friend from school. The major subenvi Shane engages in activities at Joe's restaurant are at the table and in the waiting area. He goes to the YMCA with his siste week to swim. The main subenvironments in which he engages YMCA include the changing area, pool, shower, and bathroom environments are broken down into key subenvironments using

Step 4: Identify critical activities within each subenvironme is to list all of the activities that are required by the stu subenvironment. These activities should be skills that the t peer would be able to perform in that subenvironment. Wh assessment of the activities within each environment it is re communication, choice, and social skills should be inclu Traditionally, ecological assessments have not included so nication skills within the assessment process. More rec demonstrated the importance of teaching communication ongoing natural routines (Sigafoos, Arthur-Kelly, & B Additionally, it is important to include opportunities for ongoing activities (Cannella et al., 2005). Therefore, the a within this example of an ecological assessment reflect t enhancing choice and communication skills for these stude

Example: The critical activities in each subenvironment a Restaurant in Table III. There are a variety of activities within eac Some activities differ across each subenvironment but others are activities and common environments should indicate that th

and activities should have priority when it comes to developing inst
the upcoming academic year. It is also important to note that there
(e.g., greeting people), choice (e.g., selecting from the menu), con
ordering food), and self-help (e.g., appropriately using a fork a
Shane.

Step 5: Assess student performance on each of the critical s
step of the ecological assessment the teacher must describe c
student behavior for each activity in such a manner that it c
This step involves describing, in overt terms, what a studen
order to perform each activity appropriately. Once this step
teacher can obtain a clear picture of the student's performan
of the activities. In other words, the teacher can now obs
perform these behaviors in the targeted environments and s
This assessment can therefore allow the IEP team to pi
strength (e.g., the student possesses many of the behavio
targeted activity) and weakness (e.g., the student may have
to perform a targeted activity). Areas of strength may need
tional input, whereas the student will need ongoing instr
activities. The teacher is again able to prioritize instructi
this level of the assessment for the upcoming academic year

Skills identified in each subenvironment can typically
discrete behaviors or complex chains of behavior. A d
might include a communication or social skill. For exam
may learn to greet the teacher ("Good morning, Ms. Shea
arrives in the morning. In this example, greeting is a single o
occurs within a very specific context (when the student fi
morning). Other skills may include complex chains of behavi
the skill of hand washing may include turning on the

instructional strategies might be best suited to teach differ
cussion of matching instructional strategies to targeted ski
scope of this chapter (see Snell & Brown, 2006).

*Example: Two of the critical skills, choosing/ordering fr
eating with a fork, are presented in Tables IV and V, respec
two preferred breakfast options on his AAC device (a pic
versus a picture of bacon and eggs). When the server greets
his order, Shane must choose from one of these breakfast
chooses between milk and orange juice in a similar fashion
When the meal is served, Shane's dad cuts the food into bite-si
then uses his fork to eat the food. He is learning to use a fo
Fork use is broken into a chain of responses. His performance
on these behaviors on two occasions. On both occasions he ord
appropriately (see Table IV). He is experiencing some difficul
especially holding the fork appropriately* (see *Table V*).

IV. ONGOING ASSESSMENT

Up until this point in the chapter we have discussed a set
can be used to identify and prioritize meaningful and measu
goals for students with intellectual disabilities. Equally impo
lish a method of ongoing assessment of educational goals
demic year. It is important to assess educational objective

TABLE IV
CHECKLIST FOR USING AAC DEVICE TO ORDER BRE

	4/1
Makes meal choice at appropriate time	+
Makes drink choice at appropriate time	+

The "+" sign indicates that the skill was performed correctly.

Put fork in mouth	+
Close lips around food	+
Remove fork, leaving food in mouth	+
Bring fork down and places on plate	+
Chew and swallow food completely	+
Repeat steps 1–9 as necessary	–

The "+" sign indicates that the step was performed correctly while the "-
the step was performed incorrectly.

basis for a number of reasons. First, it is required by the I
that ongoing assessment of student performance be con
ongoing assessment allows for data-based documentation
ress on the identified educational goals throughout the aca
very important to have a clear overall picture of where the s
progress and where he or she may be experiencing difficulties
example, a student may achieve some educational objectives
circumstances new educational goals should be selected. In
the student may not be making adequate progress on educat
may indicate that the goals were not appropriate (e.g., t
perhaps the instructional strategies were not adequate. In su
alternative educational goals may be selected, the current e
may be subdivided into more manageable educational goa
instructional strategies may be evaluated. Second, ongoing
vides stakeholders (e.g., parents) with frequent feedback as
performance. For example, the student's performance migh
weekly by the teacher and provided to the family in written

The strategies identified for selecting educational goals ca
provide an ongoing assessment of student progress during th
For example, the process of ecological assessment result
objectively defined discrete behaviors (e.g., communication
and complex chains of behaviors (e.g., domestic, vocational,
skills). The end result of an ecological assessment (e.g.,
targeted skill clusters) allows the teacher to objectively meas
of these skills on an ongoing basis. We also mentioned earli

in preference. Finally, it is important to assess skills that
been mastered during the year and assess for maintenance o
often the case that skills may not maintain at criterion perfo
need further instruction.

V. SUMMARY

Educational assessment is a very important process f
intellectual disabilities. Assessment is used to determine st
to create an appropriate curriculum for the student, and to
progress during the academic year. Much of the educat
process is mandated by legislation. In this chapter we focuse
or functional assessment process that is used to determine
age-appropriate curriculum for a student. Several key feat
assessment were highlighted. For example, it is important t
and the student in an active and meaningful way in the p
A person-centered planning model of curriculum developme
helpful in this respect. Strategies for assessing student prefe
should also be used in the curriculum development and on
process. Educational goals stemming from the person-ce
process should then be translated into observable skills an
instruction using an ecological assessment process. Finally,
fied during the ecological assessment should be measured
basis during the academic year to assess student progress a
in the educational goals as needed.

REFERENCES

Bayley, N. (1993). *Bayley Scales of Infant Development II*. San Antonio
Corporation.

Brown, L., Branston, M., Harme-Nietupski, S., Pumpian, I., Certo, N
(1979). A strategy for developing chronological-age-appropriate and
content for severely handicapped adolescents and young adults. *Jour
tion, 13,* 81–90.

repetition for people with profound developmental disabilities: An a
ences. *Research in Developmental Disabilities, 19,* 189–199.
Lancioni, G., O'Reilly, M., & Emerson, E. (1996). A review of choice resea
severe and profound developmental disabilities. *Research in Developm*
391–411.
Lancioni, G., O'Reilly, M., & Oliva, D. (2002). Engagement in cooperative
Assessing the performance and preferences of persons with multiple d
Visual Impairment and Blindness, 96, 50–53.
Lancioni, G., Singh, N., O'Reilly, M., & Oliva, D. (2003). Some recen
microswitches for persons with multiple disabilities. *Journal of Chila*
12, 251–256.
Lancioni, G., Singh, N., O'Reilly, M., Oliva, D., & Basili, G. (2005). An ov
increasing indices of happiness of people with severe/profound inte
disabilities. *Disability and Rehabilitation, 27,* 83–93.
Mount, B., & Zwernik, K. (1988). *It's never too early, it's never too late: A b*
futures planning. St Paul, MN: St. Paul Metropolitan Council.
No Child left Behind Act of 2001. Pub. L. No. 107–110, § 101, 115 Stat. 14
O'Brien, J., O'Brien, C., & Mount, B. (1997). Person-centered planning ha
Mental Retardation, 35, 480–488.
Public Law 94–142 (1975). *Federal Register, 42,* 42474–42518.
Roane, H., Vollmer, T., Ringdahl, J., & Marcus, B. (1998). Evaluation
preference assessment. *Journal of Applied Behavior Analysis, 31,* 605–
Snell, M., & Brown, F. (2006). *Instruction of students with severe disabilities*
Ohio: Pearson, Merrill, Prentice Hall.
Roid, G. H. (2003). *Stanford-Binet intelligence scales* (5th ed.). Chicago: R
Siegel, E., & Allinder, R. (2005). Review of assessment procedures for stu
and severe disabilities. *Education and Training in Developmental Disa*
Sigafoos, J., Arthur-Kelly, M., & Butterfield, N. (2006). *Enhancing everyda*
children with disabilities. Baltimore: Paul H. Brookes.
Sigafoos, J., Arthur, M., & O'Reilly, M. (2003). *Challenging behavior and dev*
London: Whurr Publishers.
Sparrow, S. S., Balla, D. A., & Cicchetti, D. V. (1984). *Vineland adap*
Interview edition. Circle Pines MN: American Guidance Service.
The Individuals with Disabilities Education Improvement Act of 2004, P
§ 101, 118 Stat. 2647 (2004).
The Individuals with Disabilities Act Amendments of 1997, Pub. L. No. 17
37 (1997).
The Individuals with Disabilities Education Act of 1990, 20 U.S.C. §§ 1400