

**Mental Cognitive Subcommittee
Content Model and Classification Recommendations**

APPENDIX C

**Report of the
Metal-Cognitive Subcommittee**

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**REPORT OF THE MENTAL COGNITIVE SUBCOMMITTEE OF THE
OCCUPATIONAL INFORMATION DEVELOPMENT ADVISORY PANEL**

Subcommittee Chair

David J. Schretlen, Ph.D.

Subcommittee Members

Robert T. Fraser, Ph.D.

Sylvia E. Karman, Project Director

September 1, 2009

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Executive Summary

The Mental Cognitive Subcommittee was assembled to advise the OIDAP about what psychological abilities of disability applicants should be included in the Content Model and Classification Recommendations made to the Social Security Administration.

The Subcommittee reviewed relevant scientific literature, consulted experts in the fields of psychiatric disability and vocational outcomes research, heard presentations by academic experts, staff members of the Social Security Administration (SSA), and Disability Determination Services (DDS), and interviewed medical consultants and disability claims examiners for the Maryland State DDS office. The Subcommittee convened a Roundtable Meeting in Chicago in June 2009 that was attended by participants representing a broad range of expertise. Roundtable participants were asked to nominate human abilities they regarded as essential for work, and to discuss their rationale for including each element. The Subcommittee met both in person and via telephone conference to synthesize the data obtained from these activities and sources. Finally, other OIDAP members and Roundtable participants were asked to comment on the provisional synthesis of essential human abilities that the Subcommittee recommends for inclusion in the Content Model. The essential recommendations of this Subcommittee are as follows:

1. The conceptual model of psychological abilities required to do work should be revised. The aims are to redress shortcomings of the current model, base a revised model on scientific evidence, identify specific abilities that can be reliably assessed and tested for predictive validity, and retain elements of the current mental residual functional capacity (MRFC) model that meet these criteria in order to maintain continuity where possible.
2. Psychological abilities that are deemed essential to do work are conceptualized as falling into four core categories: (A) neurocognitive functioning, (B) initiative & persistence, (C) interpersonal functioning, and (D) self-management.
3. The Subcommittee recommends that SSA adopt 15 abilities that represent specific aspects of the four general categories listed above. These abilities and the rationale for including each are described in the report.
4. The Subcommittee recommends that it provide ongoing consultation to the OIS Project's psychometrician as the SSA develops items for data collection. The SSA should consider using different methods and scales, depending on the psychological ability being assessed.
5. The Subcommittee recommends a series of studies to determine the reliability and predictive validity of any instruments developed to assess residual functional capacities and occupational demands as part of the OIS Project.

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Introduction

The Mental Cognitive Subcommittee was convened by the OIDAP Chair. The members initially included David J. Schretlen, PhD (Chair), Robert T. Fraser, PhD, Sylvia E. Karman, and Mary Barros-Bailey, PhD. However, Dr. Barros-Bailey subsequently withdrew from membership. A biographical sketch of each member appears in Appendix A of this report.

In a working paper entitled “What is a Content Model?” the SSA concluded that the Occupational Information System it plans to develop must describe the personal abilities and characteristics that individuals must possess in order to be able to perform each occupation. Further, these abilities and characteristics must be defined in ways that are maximally useful for assessing the residual functional capacity (RFC) of claimants. In response, the OIDAP Chair appointed a Mental Cognitive Subcommittee to review mental abilities that can be impaired by illness or injury, and thereby impede a person’s ability to do work. The aim of this subcommittee was to make recommendations about how to conceptualize the mental and interpersonal characteristics required to do work. The characteristics of interest are circled in Figure 1 below, with a primary emphasis on intermediate levels of abstraction.

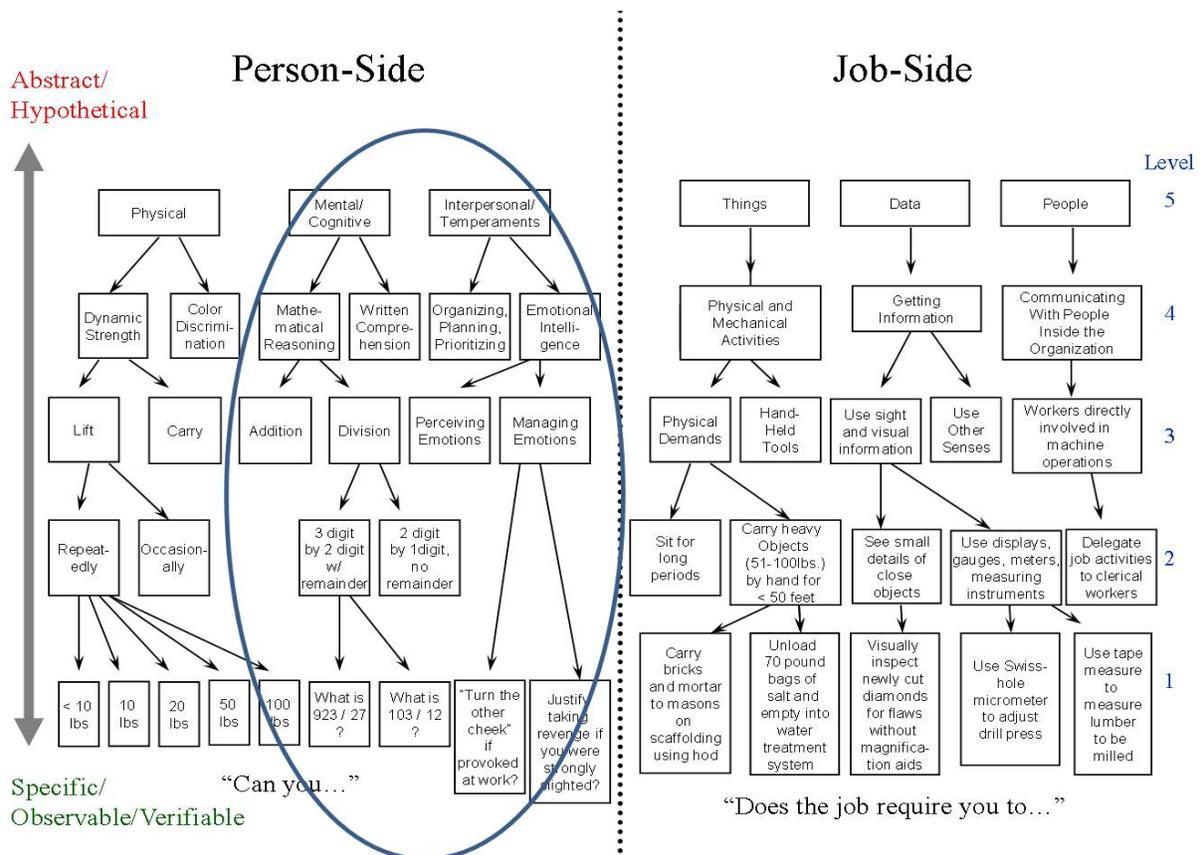


Figure 1. Cartoon depicts the person-side and job-side characteristics to be considered for inclusion in an occupational information system. The Mental Cognitive Subcommittee was asked to help OIDAP conceptualize the essential psychological abilities at intermediate levels of abstraction that should be included in such a model.

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Methodology, Procedures, and Findings

Mental Cognitive Subcommittee discussions and activities: The subcommittee's approach to data gathering and analysis consisted of multiple activities. These included break-out meetings at the second quarterly OIDAP meeting in Atlanta, Georgia, and the third quarterly OIDAP meeting in Chicago, Illinois. In addition, the subcommittee met by telephone conference calls seven times between March 17, 2009, and August 12, 2009.

In the first telephone conference, subcommittee members agreed to review the MRFC assessment (SSA-4734-F4-SUP) currently used for disability determination purposes, and to discuss its elements at the next meeting. Subcommittee members agreed to consider what psychological variables should be included in the content model for an ideal OIS, how they should be measured, and what existing sources of empirical data linking specific aspects of cognitive, emotional, and behavioral functioning to job performance are available for review. At the second telephone conference, Dr. Fraser proposed that an ideal behavioral assessment would include measures of processing speed, divided attention, incidental memory, executive abilities, and verbal fluency. He noted that depression and anxiety are important to assess because they are known to impede job maintenance. He also cited research showing that variables that predict return to work can differ from those that predict job maintenance, and that optimal predictors vary by medical condition (e.g., traumatic brain injury versus multiple sclerosis). Dr. Barros-Bailey emphasized the importance of assessing an individual's capacity to initiate tasks and inhibit behavioral outbursts, as well as the importance of determining the validity of any assessment instruments developed. Dr. Schretlen asked whether the SSA might be willing to consider funding or conducting research designed to empirically determine the cognitive and other "person-side" abilities and characteristics required to successfully meet the demands of selected occupations.

As a result of these telephone conferences and a discussion at the second quarterly meeting of the OIDAP, the subcommittee decided to convene a Roundtable Meeting on June 8, 2009. The meeting agenda and which experts to invite were discussed via email correspondence and during telephone conference calls on May 8 and 19, 2009. Results of the June Roundtable Meeting were discussed by the subcommittee on July 21, 2009 and August 5, 2009. These discussions focused on synthesizing feedback obtained from participants both during and after the June Roundtable Meeting. Subcommittee members debated the merits and limitations of various conceptualizations of both the overarching categories or dimensions of psychological and interpersonal abilities that are required to perform work, as well as the specific exemplars of these categories. These discussions informed recommendations made in the subcommittee's final report to the OIDAP.

Presentations to the OIDAP and Mental Cognitive Subcommittee: Information derived from presentations made to and by the subcommittee also was considered for inclusion in the subcommittee's report to the OIDAP. Points of greatest relevance to the subcommittee's charge are summarized below.

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First Mental Cognitive Subcommittee Presentation: At the OIDAP quarterly meeting on April 29, 2009, Dr. Schretlen gave a presentation entitled “Cognitive Assessment for the Determination of Mental Residual Functional Capacity.” In this presentation, he explained that individual differences in cognitive performance strongly predict occupational attainment in healthy adults, and often predict work outcomes (employment, disability, job placement, work performance) better than symptom or injury severity in many psychiatric conditions, such as schizophrenia, traumatic brain injury, and multiple sclerosis. He suggested that this makes cognitive impairment a sort of “final common pathway” to work disability. However, he pointed out that most research on the relationship between cognitive functioning and work is based on performance-based measures, such as individually administered tests of IQ, attention, and memory. Consequently, if SSA elects to rely on ratings derived from medical records or other informants to assess cognitive abilities, it will be essential to validate such ratings against performance-based measures of residual cognitive abilities.

Dr. Schretlen next pointed out that the universe of cognitive processes can be parsed into smaller “factors” many different ways. He described and contrasted the statistical methods of exploratory and confirmatory factor analysis. He then reviewed the results of 19 studies that investigated the underlying or latent structure of cognitive functioning among healthy adults and patients with neuropsychiatric disorders. This showed that there is scientific evidence for varied factor structures. Dr. Schretlen discussed the advantages and disadvantages of adopting a parsimonious model of cognitive functioning (just one or two factors) versus a more complex model (three or more factors). A single summary measure of residual cognitive capacity (such as “*g*”) has the advantages of being easily understood, reliably measured, and strongly predictive of work outcomes. The main disadvantage is that relying solely on *g* might mask more specific cognitive impairments that could preclude the ability to work. Dr. Schretlen then showed a table from the Wonderlic Personnel Test (WPT) manual depicting the WPT scores of several thousand adults in 70+ occupations. The WPT reliably measures *g* in 12 minutes, and the table clearly demonstrates that scores on this test vary by occupation, likely due to differences in occupational complexity. Further, nearly half of the 100 most widespread occupational groups overlapped with jobs for which incumbents’ WPT scores were reported in the test manual, and their scores spanned a very broad range. Dr. Schretlen then presented the findings of two studies conducted at Johns Hopkins. One showed that a very brief test that measures two cognitive factors (the Mental Status Exam –Telephone Version or MSE–TV) distinguished SSI/SSDI beneficiaries who were found disabled due to a mental disorder from healthy adults with very large effect sizes. The other study involved a confirmatory factor analysis of 15 cognitive measures in 576 adults. It showed that a six-factor model of cognitive architecture applied equally well to healthy adults and patients with schizophrenia or bipolar disorder despite large group differences in overall levels of performance on the cognitive tests. Dr. Schretlen concluded the presentation by reiterating the point that the SSA will have to decide whether to use performance-based measures (like IQ tests) or informant ratings (as currently used for MRFC assessment) to measure psychological abilities that are essential to work. He emphasized that validating any new instruments

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to assess psychological abilities also will require the SSA to determine what level of impairment shall define a disability “threshold.” Finally, he urged the SSA to develop proprietary measures, rather than rely on previously published psychological tests, and to conduct the necessary research to validate measures that are adopted. Slides and references for this presentation are shown in Appendix D.

Second Mental Cognitive Subcommittee Presentation: At the OIDAP quarterly meeting on June 10, 2009, Dr. Schretlen presented a talk entitled “Clinical Inference in the Assessment of Mental Residual Functional Capacity.” In this presentation, he outlined three major approaches that the SSA might use to draw inferences about whether an individual claimant has sufficient residual psychological (or physical) capacities to do work. The aim of this talk was to discuss the underlying logic and threats to the validity of each method of inference. The first method involves reliance on pathognomonic signs, such as a positive Babinski reflex that signifies the presence of an upper motor neuron lesion. Dr. Schretlen explained that the major limitations of this method are that the reliability with which such pathognomonic signs can be elicited and the frequency of their appearance in normal (i.e., non-pathological) populations are rarely assessed. He presented data showing that many so-called pathognomonic signs occur quite frequently in healthy adults. The implication of these limitations is that the SSA should not assume that successful job incumbents are free of such signs. For example, if an occupation requires frequent lifting of 25 pounds from the ground, it would be prudent to study a random selection of persons who successfully work in that occupation to determine how many of them are unable to frequently lift 25 pounds from the ground. The SSA should not assume that all successful job incumbents in that occupational category can do so.

The second approach to inference involves pattern analysis, or the identification of a clinically recognizable gestalt of signs, symptoms, and laboratory findings, to diagnose a disease or condition. This approach to inference probably mirrors the logical task of matching an individual claimant’s RFC to specific occupational demands. A great deal of empirical evidence supports the validity of this approach to inference, but it has two limitations: First, it works best for individuals whose clinical presentations are typical of a given disease or condition. It is more difficult to diagnose a disease or condition when the patient’s presentation is atypical, or when the clinical presentation is obscured by the presence of co-occurring conditions or treatment side-effects. The second limitation is that normal intra-individual variability can be misinterpreted as meaningful. For example, Dr. Schretlen showed that in one study, 197 normal healthy adults showed an average discrepancy of more than 3 standard deviations (i.e., the equivalent of >50 IQ points) between their best and worst score on a battery of cognitive tests. Dr. Schretlen concluded that the logic of this approach closely mirrors the process of matching RFC with job demands, but he cautioned that empirical study of populations of individuals with and without disabilities is needed to validate the approach.

The third method of clinical inference involves deficit measurement. Dr. Schretlen pointed out that this is the most widely used and accepted approach to diagnosing impairment. An IQ of 70 falls 2 standard deviations below the mean and places one

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among the lowest 2% of the population in overall intelligence. Scores below this are widely considered abnormal. Likewise, laboratory blood values or measures of physical strength that place one among the lowest 2% of the population are also usually interpreted as abnormal. However, some diseases or injuries might cause a decrement in some ability, even though the person's residual capacity remains within the normal range for the population as a whole. For example, an attorney who sustains a severe traumatic brain injury might lose 25 IQ points as a result. However, if her IQ was 120 before the accident, it would still fall within the average range after the accident. Thus, impairment can be defined by an ability that is very low compared to the population as a whole, or by a decline from a person's own pre-morbid level of functioning.

Dr. Schretlen pointed out that these observations have important implications. One is that these two scenarios suggest that we need to establish different types of cutoffs to define "impairment." He also presented data which show that normal adults frequently produce one or two abnormal scores using any cutoff when enough tests are administered. Dr. Schretlen concluded the talk by pointing out that a study of successful job incumbents would probably show that many, and perhaps even most, people fall short of meeting one or more of their usual job demands. He noted that whatever cutoff the SSA uses to define insufficient RFC to meet a job demand will directly affect the percentage of applicants who will be found disabled. He asked whether a claimant whose upper extremity strength exceeds that of the weakest 10% of successful incumbents in a given occupation should be deemed able to do that job. Obviously, the claimant can meet that job's strength demands to some degree because 10% of successful job incumbents are weaker than he. However, maybe the 10% of successful job incumbents who are weaker were stronger when they were hired, and would not be hired if they applied for the same job today. The point is that the SSA will have to decide what cutoff defines insufficient RFC if disability determination is ever based on empirical evidence. Finally, Dr. Schretlen also discussed the issue of "effort" and how suboptimal effort can uncouple the linkage between ability and performance on tests of psychological functioning, strength, etc. Slides and references for this presentation are shown in Appendix E.

Mental Cognitive Roundtable: On June 8, 2009, the Subcommittee held a Roundtable meeting in Chicago, Illinois, to solicit opinions from and facilitate discussion by experts in the field about mental impairments that cause work disability. In a series of discussions, the Mental Cognitive Subcommittee identified and invited a panel of experts to participate in a one-day meeting for this purpose. Participants were provided with background materials ahead of the meeting (see Appendix C). The first document explained the purpose and scope of the Roundtable. It asked each participant to review the current MRFC assessment (SSA-4734-SUP), and then write a brief response to each of four questions before the meeting. The four questions were as follows:

1. If you think the current MRFC Assessment does not need revision, or that improving it is not feasible, explain why.

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2. If you think the existing MRFC Assessment could be improved, then nominate up to 10 dimensions of psychological and interpersonal functioning that, when impaired by disease or injury, impede one’s ability to work.¹
3. Do you know of any well-designed empirical studies that have identified psychological or interpersonal deficits that decrease the likelihood an affected individual will be able to do competitive work?
4. While the goal of this Roundtable is not to devise measures of the person characteristics you nominate in response to Question 2, please comment on what you deem to be the best approach (informant-rating, self-rating, direct observation, testing) to assess the characteristics you enumerated. (These might vary across functions.)

The Roundtable participants, their affiliations, and areas of expertise are shown in the table below. Each participant’s biographic sketch appears in Appendix B.

Name	Affiliation	Expertise
David J. Schretlen, PhD, ABPP	OIDAP Mental Cognitive Subcommittee (chair); Johns Hopkins University	Clinical neuropsychology; cognitive & neuroimaging correlates of disability
Robert T. Fraser, PhD	OIDAP Mental Cognitive Subcommittee; University of Washington	Rehabilitation psychology; TBI; epilepsy; multiple sclerosis
Marry Barros-Bailey, PhD, CRC	OIDAP (chair); Mental Cognitive Subcommittee; Private Practice	Rehabilitation counseling; life care planning; vocational expert
Sylvia E. Karman, BA	SSA; Director, Occupational Information Dev. Project; Mental Cognitive Subcom.	SSA disability programs; use of the DOT for disability adjudication
Mark Wilson, PhD	OIDAP Work Taxonomy Subcommittee (chair); North Carolina State University	Industrial and organizational psychology; occupational analysis
Shannon Gwaltney-Gibson, PhD	OIDAP Work Taxonomy Subcommittee; East Carolina University	Industrial and organizational psychology; occupational analysis
E. Sally Rogers, ScD	Director of Research, Center for Psychiatric Rehabilitation, Boston University	Psychiatric rehabilitation outcomes research; vocational recovery
Gary R. Bond, PhD	Professor, Department of Psychiatry, Dartmouth University School of Medicine	Psychiatric rehabilitation outcomes research; supported employment
Susanne Bruyère, PhD	Director, Employment and Disability Institute, ILR School, Cornell University	Disability policy and discrimination; rehabilitation outcomes research
Lynda Payne, PhD	Maryland Disability Determination Services, Consulting Psychologist	Developmental psychology, psychiatric disability
Pamela A. Warren, PhD	Departments of Psychology and Psychiatry, University of Illinois	Occupational and health psychology; psychological disability management

¹ For purposes of calibrating the level of specificity that we are looking for, a capacity such as “the ability to reason” is too global and nonspecific. Conversely, a capacity such as “the ability to tolerate occasional brusque remarks from co-workers without losing one’s temper” might be too specific. Because our aim is to develop a list of candidate abilities that is comprehensive but parsimonious, we ask that you limit your list to about 10 functional capacities. Based on SSA requirements, these dimensions or factors must be observable and measurable.

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In addition to the Roundtable participants, 16 representatives of SSA and other stakeholder associations observed the proceedings and asked questions of the panelists. These included:

Aliza Gordon, SSA

Deborah Harkin, SSA

Debra Tidwell-Peters, SSA

Elaina Wise, SSA

Elizabeth A. Kennedy, SSA

George D. Harris, SSA

John E. Owen, III, SSA

Michele Schaefer, SSA

Nancy Torkas, SSA

Paul Kryglik, SSA

Robert J. Harvey, SSA

Robert Pfaff, SSA

Shirleen B. Roth, SSA

Susan J. Swansiger, SSA

Thomas A. Hardy, OIDAP

Tom Johns, SSA

Elizabeth Rasch, NIH

Ms. Karman opened the Roundtable by providing a brief overview of the OIDAP. Then, following brief remarks by Dr. Fraser, Dr. Schretlen opened the Roundtable discussion by asking participants to address Question 1 from the Purpose and Scope invitation. Participants uniformly agreed that the current MRFC assessment could be improved. Dr. Rogers noted that the form is oriented toward lower level occupations and that some items assess two abilities, making it difficult to rate an individual who shows no limitation in one respect but some limitation in the other. Dr. Warren and others noted that the ratings are cross-sectional but illness-related impairments wax and wane over time. Dr. Bond noted that impairments are often situation-specific, and Dr. Rogers emphasized that observer ratings based on situational assessments have generally been found to be more predictive of work outcomes in mental illness than pencil-and-paper tests or ratings of an individual's personal characteristics. Dr. Payne observed that the current rating scheme is too coarse (not significantly limited; moderately limited; markedly limited), lacks sensitivity to fluctuations over time, and does not mirror occupational demands. Drs. Wilson, Gwaltney-Gibson, and others concurred that the inferential leap between residual abilities and job demands is too large. Dr. Fraser noted that the items are not evenly distributed across cognitive domains (e.g., eight concern attention/concentration, whereas only three concern memory and reasoning). Dr. Payne also noted that the items probably are not weighted equally in terms of how disabling they are.

Most of the Roundtable discussion focused on Question 2, which asked participants to nominate dimensions of psychological and interpersonal functioning that, when impaired by disease or injury, impede one's ability to work. Responses to the 20 individual items

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that inform the current MRFC assessment (SSA-4734-SUP) included the following comments:

1. *The ability to remember locations and work-like procedures.* The locations queried by this item are unclear. Also, why ask about “work-like” procedures?
2. *The ability to understand and remember very short and simple instructions.* What defines very short and simple instructions is unclear. If someone understands instructions but cannot remember them, how is this rated?
3. *The ability to understand and remember detailed instructions.* These abilities could be assessed with a single item that rates information complexity (e.g., the person can understand and remember simple but not complex instructions).
4. *The ability to carry out very short and simple instructions.* Since it is highly unlikely that someone can carry out short and simple instructions without understanding them, these items are redundant.
5. *The ability to carry out detailed instructions.* Again, 4 and 5 could be combined in a single item that rates complexity.
6. *The ability to maintain attention and concentration for extended periods.* The qualifier “extended” lacks specificity. Item does not capture differences in kinds or intensity of attention required by different jobs.
7. *The ability to perform activities within a schedule, maintain regular attendance, and be punctual within customary tolerances.* There was widespread agreement that an item like this should be retained.
8. *The ability to sustain an ordinary routine without special supervision.* Despite lively debate, several participants argued that an item rating one’s ability to work in a reasonably independent fashion is useful. In response to question of whether job descriptions can reference level of supervision they entail, Dr. Wilson said “yes.”
9. *The ability to work in coordination with or proximity to others without being distracted by them.* Equally disabling is whether is person is distracting to others. It was suggested that we could assess distractibility to and by others in an item about problems working with other people. Also, it was noted that many people are more distracted by technology (surfing the Internet, text messaging) than by other people.
10. *The ability to make simple work-related decisions.* Several participants felt that this item is unnecessary as it is too low-level. However, degree of decision making is a fundamental dimension by which jobs vary, so some assessment of this should be retained.

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11. *The ability to complete a normal workday and workweek without interruptions by psychological symptoms.* Although this item is multi-faceted, it is the only item that rates functioning over a week and it maps onto actual work demands.
12. *The ability to interact appropriately with the general public.* While several participants felt that this is an important ability, it also was noted that there is no disease or injury that selectively impairs one's ability to interact with the general public but not coworkers or supervisors.
13. *The ability to ask simple questions or request assistance.* Concern about this item centered on the qualifier "simple." In general, rating assertiveness was endorsed.
14. *The ability to accept instruction and respond appropriately to criticism from supervisors.* Despite differences of opinion about whether to assess reactions to "criticism," "feedback," or "direction," there was broad agreement that the ability to deal with authority and supervision at work is important to assess.
15. *The ability to get along with coworkers or peers without distracting them or exhibiting behavioral extremes.* Concern was expressed about the complexity of this item and use of the term "behavioral extremes."
16. *The ability to maintain socially appropriate behavior and to adhere to basic standards of neatness and cleanliness.* Participants favored separating hygiene and socially appropriate behavior, as these often do not correlate and they have different implications in terms of meeting the demands of different jobs.
17. *The ability to respond appropriately to changes in the work setting.* There was broad agreement that it is important to assess flexibility in response to changing demands.
18. *The ability to be aware of normal hazards and take appropriate precautions.* This item is set so low that it does not discriminate among applicants or the ability to meet different job demands. Essentially, lacking awareness of normal hazards or the ability to take needed precautions probably precludes any form of employment.
19. *The ability to travel in unfamiliar places or use public transportation.* Several participants expressed doubt that this item is necessary.
20. *The ability to set realistic goals or make plans independently of others.* Several participants suggested that an item assessing executive functioning would be useful.

In response to Question 3, all of the Roundtable participants indicated that they were not aware of any large scale studies or research databases linking MRFC to the performance of specific work demands in any normal, psychiatric, or neurological population. Many small studies and some large scale studies that examined demographic, clinical, and cognitive predictors of work outcomes have been reported,

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but none of these offers the level of specificity required by SSA to link MRFC to work. Drs. Fraser, Rogers, Bond, and Bruyère all provided references and/or PDF files of articles of potential interest. These articles have been reviewed by the Mental Cognitive Subcommittee and cited in the reference section of this report.

This research is chiefly found within the psychiatric vocational rehabilitation literature. A number of these studies support social or interpersonal skills as consistently related to job success (Becker et al., 1998; MacDonald-Wilson, Rogers, & Anthony, 2001; Tsang et al., 2000). A fifteen-year review of the psychiatric rehabilitation literature indicated mixed results related to psychiatric symptoms or diagnoses, but confirmed social skills as a consistent predictor of work outcome for people with psychiatric disabilities. MacDonald-Wilson, Rogers, and Anthony (2001) conclude that although psychiatric diagnoses and symptoms tend to be related to poorer vocational outcomes, there is not a high correlation as supported by the research to date.

In terms of cognitive functioning and vocational status, there are some limited studies that indicate a relationship. Gold et al. (1999), using the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS), established significant differences between employed and unemployed participants on the total battery score and four index scores (immediate memory, delayed memory, attention, and language). In a later study, Gold et al. (2002), using a full neuropsychological battery, established that measures of IQ, attention, working memory, and problem solving were related to job tenure as assessed over 24 months. In summarizing the existing literature, although there are some established findings, further study is needed in relation to these domains of interpersonal, emotional, and cognitive functioning and vocational status (MacDonald-Wilson, Rogers, & Anthony, 2001). This research needs to be extended outside the bounds of psychiatric rehabilitation and involve larger mainstream samples with more discrete and standardized measures of functioning as related to successful job tenure.

Finally, in response to Question 4, the Roundtable participants briefly discussed their thoughts about the most useful approaches to measurement of MRFC. Several themes emerged from this discussion. First, it was universally recognized that any assessment of MRFC must incorporate a longitudinal component because most mental disorders involve some degree of functional variability over time, and some disorders, such as recurrent major depression or bipolar disorder, are usually characterized by episodes of impairment separated by periods of more intact functioning. One potential approach to this would be to include ratings of frequency of impairment over time (e.g., interpersonal conflicts could be rated in terms of frequency over time).

Another criticism was that the current ratings (not significantly limited, moderately limited, and markedly limited) are too coarse and lack clear definitions. One approach to improving this would be to use behaviorally anchored rating scales (BARS). Another would be to specify intensity or complexity in quantitative terms.

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In the context of this discussion, Dr. Elizabeth Rasch asked for a description of situational assessments. Dr. Rogers explained that they typically involve having a trained rater observe while a person engages in work-related tasks. The observer then rates the person's engagement in work activities using rating scales, often with behavioral anchors. The examination can take up to six hours, and it enables the examiner to make very realistic observations of a person's pace, persistence, self-direction, rate of on-task behavior, etc. Dr. Bond added that a limitation of work sample observation is that assigned tasks might bear little resemblance to the kind of work that a given patient wants or intends to do.

Finally, there was some discussion of the need to consider additive and interaction effects. This would require an empirical study involving relatively large samples of workers with and without disabilities in order to test higher-order relationships among predictors of work outcomes.

Following the Roundtable, participants were asked to revise their pre-meeting responses to the four questions based on the discussions held in Chicago. Dr. Schretlen took the post-meeting responses to Question 2 (or pre-meeting responses of those who did not submit revisions), and created a matrix of psychological abilities nominated by each participant for inclusion in an MRFC assessment. These are shown in the table on the next two pages.

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Core Psychological Abilities Nominated by Roundtable Participants as Essential for Work

	David Schretlen	Bob Fraser	Lynda Payne	E. Sally Rogers	Gary Bond	Pamela Warren	Susanne Bruyere
Information Processing and Decision Making							
1	General cognitive ability	Reasoning & problem-solving (verbal, visual)	Cognitive ability	Capacity to learn to new skills			Information processing ability
2	Communication & language	Ability to communicate (with co-workers, supervisors & public)		Written and oral expression	Communication skills	Language abilities	
3	Verbal memory ability	Ability to understand & remember verbal instructions & work-relevant material	Memory			Memory, short and long-term	Recall information
4	Visual memory ability	Ability to understand & remember visual instructions & work-relevant material	Memory			Visual-spatial processing	
5	Psychomotor speed	Ability to process information efficiently		Speed of processing		Motor skills & dexterity	Speed of information processing
6	Attention & distractibility	Ability to attend & concentrate			Attention	Attention; focus	Avoid distractibility
7	Executive functioning	Ability to initiate, perform, and regulate task sequences	Flexibility, executive functioning planning, emotional regulation	Organizational capacity	Adapt to ambiguity		Flexibility in response to competing and changing demands
8	Other candidates		Independent decision-making ability	Exercise good judgment	Judgment; Ability to follow instructions	Ability to comply with instructions	Interpret and execute info; Sequence tasks
Initiative & Persistence							
1	Attendance & punctuality	Ability to initiate & persist in work activities	Leave the house	Initiate work tasks			
2	Ability to complete tasks independently		Ability to complete tasks independently	Motivation and work identity			
3	Persistence (hours/day)				Persistence		

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	David Schretlen	Bob Fraser	Lynda Payne	E. Sally Rogers	Gary Bond	Pamela Warren	Susanne Bruyere
4	Persistence (days/week)	Ability to perform simple tasks at an acceptable quality level within reasonable timelines	Stamina & persistence to consistently work 40 hrs/week				
Interpersonal Functioning							
1	Interpersonal friction	Ability to interact cooperatively and flexibly (w/ supervisor, coworkers, public)	Ability to interact with others (co-workers, supervisors & public)		The ability to work with others on tasks		
2	Response to criticism	Ability to respond to feedback/criticism (from supervisor, coworkers, public)	Ability to accept supervisory guidance		The ability to respond to supervision	Effort at work	Deal with stressful interactions
3	Assertiveness	Ability to assert positive and negative perceptions and feelings relative to work (w/ supervisor, coworkers, public)			Ability to express oneself when needed		
4	Other candidates		Ability to understand & interpret social cues		Social cognition		Ability to interpret social cues
Self-Management & Self-Monitoring							
1	Personal hygiene	Ability to maintain level of personal hygiene appropriate to workplace	Ability to maintain acceptable hygiene				
2	Disturbing behaviors	Ability to maintain organized and socially appropriate thinking, speech, and behavior over the work week	Ability to control symptoms				
3	Self-monitoring	Ability to maintain an acceptable level of personal and social awareness					

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	David Schretlen	Bob Fraser	Lynda Payne	E. Sally Rogers	Gary Bond	Pamela Warren	Susanne Bruyere
4	Other candidates	Ability to manage mood and emotions as appropriate on the job	emotional regulation		Affect regulation; Stress tolerance	Affective status; modulate mood	Ability to control and express emotional states
	Note about method:			Need situational assessment			

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In addition to the activities described above, the Mental Cognitive Subcommittee Chairman visited the Maryland State Disability Determination Services (Maryland DDS) office in Timonium, Maryland, on August 7, 2009. There, Dr. Schretlen interviewed Ms. Sue Page, Director, and two medical consultants, Carla Sarno, MD (chief psychiatrist) and Kenneth Wessell, EdD (chief psychologist). He also interviewed Ms. Rachel Watts and Mr. Bash Kamara, both claims examiners who have worked for Maryland DDS for 6 and 2 years, respectively. Ms. Page explained that the Maryland DDS expects to receive between 66,000 and 72,000 new applications for disability benefits during the current year, representing close to a 20% increase in applications over the previous year. She explained that the Maryland DDS has 3 psychiatrists and 13 psychologists as consultants who evaluate the medical evidence regarding mental impairments and MRFC.

In interviews, Dr. Sarno, Ms. Watts, and Mr. Kamara all reiterated the inadequate representation of longitudinal fluctuations in all aspects of psychological functioning taken into account by the current MRFC assessment. Dr. Sarno indicated that she relies primarily on the Psychiatric Technique Review Form (PRTF) to capture longitudinal aspects of psychiatric disability. All three agreed that obtaining more quantitative, specific, and behaviorally concrete measures of psychological and interpersonal abilities could greatly facilitate their work, but only if linkages between these abilities and job demands are more transparent than they are under the current system. Dr. Wessel, who has worked for 23 years as a consulting psychologist for DDS, said that he finds the current MRFC assessment adequate to adjudicate claims, and that the larger problem is obtaining the medical evidence needed to rate items and write a narrative using the MRFC form.

The Subcommittee also reviewed working papers prepared by the SSA, input from end users (comments, questions, and suggestions) based on surveys, and input from several professional organizations. Discussion of the information received from these sources will be presented in the OIDAP report.

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Based on a review of the scientific literature, presentations by staff members from the SSA, DDS, and various professional organizations to the Subcommittee and OIDAP, presentations by OIDAP Subcommittee panelists, input from experts who participated in the Chicago Roundtable, interviews of DDS staff, and internal discussions, the Mental Cognitive Subcommittee reached several conclusions that it deems relevant to the development of a new Occupational Information System. These conclusions and the recommendations to which they lead are outlined below.

Recommendation 1: The conceptual model of psychological abilities required to do work, as reflected by the current MRFC assessment, should be revised. The revised model should: (i) redress shortcomings of SSA's current conceptual model of the psychological abilities required to do work, (ii) be based on sound scientific evidence where possible, (iii) lead logically to elements that can be reliably assessed and empirically tested for predictive validity, and (iv) retain elements of the current MRFC assessment that are consistent with scientific evidence, reliably measurable, and valid predictors of the ability to work, as this will provide continuity with the existing system.

As documented in previous sections, it is widely recognized both within and outside of the SSA that the current MRFC assessment is based on a simplistic conceptual model of the psychological abilities that are required to do work. Much of the language that appears in Form SSA-4734-F4-SUP was drawn directly from the *Dictionary of Occupational Titles (DOT)* in response to the need for an instrument to complement the physical RFC assessment. However, the MRFC was never subjected to rigorous study to verify its reliability and predictive validity of the elements that comprise it.

Recommendation 1a: Any revision of the current MRFC assessment should redress the following shortcomings: (1) the underrepresentation of neurocognitive abilities, (2) the reliance on coarse and underspecified categories to rate residual abilities, (3) the failure to account for longitudinal fluctuations in mental abilities, (4) the inclusion of elements that combine disparate abilities, (5) the failure to recognize differences in the predictive power of various abilities, and (6) the large inferential leaps required to match residual abilities with job demands.

Studies of work outcome among persons with mental disorders typically regress work outcomes (e.g., employment, work performance, job loss) on multiple predictors, such as demographic variables, clinical characteristics, and measures of cognitive or social functioning. While hundreds of such studies have been published, the Subcommittee found none that examined the accuracy with which a broad set of psychological abilities predicts whether individuals with mental disorders can work and what occupational demands they can meet, *independent of their demographic background and clinical symptoms*. These are the questions that the SSA must answer to adjudicate disability claims. However, research has shown that neurocognitive test performance strongly predicts whether persons with many different mental disorders, neurological conditions, and medical diseases can work.

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Given evidence that neurocognitive functioning predicts work outcomes among persons with mental and physical disorders, the Subcommittee reviewed factor analytic studies that have examined the underlying, latent structure of cognition. The aim was to develop a parsimonious list of abilities that the SSA might use to link with occupational demands that will be described by the new OIS. Many different factor structures have been found by previous studies involving healthy and mentally disordered samples. Consequently, previous research has not yielded a single, broadly replicated factor structure to guide the Subcommittee's recommendations. On the other hand, the same research provides scientific support for several alternate models of cognitive architecture. This affords the Subcommittee and the SSA some latitude in deciding how to balance parsimony with specificity in choosing the conceptual model that will drive instrument development.

Recommendation 1b: The SSA should include aspects of neurocognitive functioning in a revised conceptual model of MRFC. This recommendation responds to the perceived failure of the current MRFC assessment to account for impairments of specific cognitive abilities. These can result from traumatic brain injury, other acquired brain disorders, developmental disorders that cause cognitive deficits without mental retardation, and various psychiatric and medical conditions in which other symptoms are primary but that also involve cognitive morbidity, such as schizophrenia. Inadequate assessment of neurocognitive impairments was noted as a shortcoming of the current MRFC assessment by every group from which the Subcommittee obtained input. Including neurocognitive abilities in a revised MRFC assessment could greatly improve SSA's ability to identify under-recognized impairment-related limitations that preclude the ability to do work.

The most parsimonious approach would be to assess general cognitive ability ("*g*"), which can be reliably measured and expressed with a single number. Numerous studies show that *g* predicts the ability to do work. Further, when job incumbents are compared, they show sizable differences on tests of *g* corresponding to differences in job complexity. However, tests of *g* are less sensitive to the deleterious effects of mental disorders than tests of some other cognitive abilities whose impairment can also limit a person's ability to work. Also, empirical research might show that another aspect of cognitive functioning predicts the ability to do work better than *g*. For these reasons, the Subcommittee recommends that the SSA adopt a multi-dimensional model of cognitive functioning for a revised MRFC assessment. While the provisional "core mental residual functional capacities" (see below) incorporate a six-factor model of neurocognitive functioning, the Subcommittee recognizes that alternate models with fewer or different factors might provide a more efficient assessment with little loss of predictive validity.

Regardless of the number and specific cognitive abilities that SSA ultimately decides to include in a revised MRFC assessment, it will be important to empirically study and eliminate any adverse disparate impact that assessing cognitive functioning could have on specific subgroups of persons applying for disability benefits, such as women, older adults, and racial or ethnic minorities.

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Because human behavior is multiply-determined, it is impossible to parse psychological abilities that are essential for work into completely orthogonal dimensions. For example, the ability to focus on a task likely reflects not only an underlying trait-like attentional capacity, but also such state-like influences as wakefulness, medication side-effects, the nature of ambient distractions, the presence of intrusive thoughts, etc. Nevertheless, the Subcommittee concluded that it is useful to group abilities that are essential for work into broad categories that are *relatively* independent. The SSA's current assessment of MRFC organizes abilities into four broad categories: (1) understanding and memory, (2) sustained concentration and persistence, (3) social interaction, and (4) adaptation. Various users (e.g., DDS medical consultants) and Roundtable participants agreed that the existing organization is imperfect but workable. The Subcommittee decided to recommend revising, rather than discarding, this organization, as described below.

Recommendation 2: The Subcommittee recommends that the SSA reorganize the elements of its MRFC into the following four categories: (1) neurocognitive functioning, (2) initiative and persistence, (3) interpersonal functioning, and (4) self-management. This revised conceptualization of MRFC elements provides greater homogeneity of within-category elements and clearer between-category distinctions of MRFC content than the organization implied by Form SSA-4734-F4-SUP.

Recommendation 3: The Subcommittee recommends that SSA adopt the psychological abilities shown under each category in the outline below entitled "Core Mental Residual Functional Capacities." The 15 abilities specified in this outline provide a comprehensive but parsimonious assessment of the four major categories of psychological functioning required to do work. However, the Subcommittee recognizes that the SSA might choose to discard or replace some of these 15 abilities, or add others that are not listed below. Therefore, a brief explanation of why each element of the proposed MRFC assessment was included and worded as shown is presented below. We also identify other abilities that the Subcommittee considered but excluded from the proposed outline, and explain the reasoning that led to each decision.

Core Mental Residual Functional Capacities

Psychological residual functional capacities are conceptualized under four major categories of functioning. Following each specific ability outlined below is a statement intended to elaborate its meaning in greater detail.

(A) Neurocognitive functioning

1. General cognitive/intellectual ability (how well a person can reason, solve problems, and meet cognitive demands of varied complexity)
2. Language & communication (how well a person can understand spoken or written language, communicate his or her thoughts, and follow directions)
3. Memory acquisition (how well a person can learn and remember new information, such as a list of words, instructions, or procedures)

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4. Attention & distractibility (how well a person can sustain the focus of attention in a work environment with ordinary distractions)
5. Processing speed (how quickly a person can respond to questions and process information)
6. Executive functioning (how well a person can plan, prioritize, organize, sequence, initiate, and execute multi-step procedures)

(B) Initiative & persistence

7. Attendance/Punctuality (how consistently a person can leave his/her residence and maintain regular attendance and punctuality)
8. Initiative (whether a person can start and perform tasks once they are explained without an unusual level of supervision)
9. Pace/Persistence (whether a person can continue performing understood tasks at an acceptable pace for a normal work week without excessive breaks)

(C) Interpersonal functioning

10. Cooperation (the extent to which a person's interactions with others are free of irritability, argumentativeness, sensitivity, or suspiciousness)
11. Response to criticism (how well a person responds to criticism, instruction, and challenges)
12. Social cognition (whether a person can navigate social interactions well enough to respond appropriately to social cues, state his or her point of view, and ask for help when needed)

(D) Self-management

13. Personal hygiene (how well a person maintains an acceptable level of personal cleanliness and socially appropriate attire)
14. Symptom control (how well a person inhibits disturbing behaviors, such as loud speech, mood swings, or responding to hallucinations)
15. Self-monitoring (how well a person can distinguish between acceptable and unacceptable work performance)

Under the first category, neurocognitive functioning, the Subcommittee recommends that the SSA adopt a six-factor model. Each of the constituent abilities has been found to predict either the ability to work or level of occupational attainment among persons with various mental disorders and/or healthy adults.

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General cognitive/intellectual ability (*g*) is the most robust predictor of occupational attainment, and corresponds more closely to job complexity than any other ability. The wording underscores the closer association of *g* with “fluid” (reasoning) than “crystallized” (knowledge) intellectual abilities.

Language & communication refer to receptive and expressive language abilities to the extent that these can be impaired by disease or injury (as in post-stroke aphasia, neurodevelopmental language disorder, etc.). The Subcommittee recognizes that this construct overlaps language “skills,” such as literacy, fluency in English, and mastery of the rules of grammar. Complicating this overlap is the fact that individuals who develop aphasia usually suffer some loss of these skills as manifestations of the underlying primary language disorder. It also should be noted that language ability differs from speech production.

Memory acquisition refers to the ability to encode, store, and retrieve new information. Impairment of this ability is referred to as anterograde amnesia. The Subcommittee excluded the loss of remote autobiographical memories or over-learned skills (i.e., retrograde amnesia) from this ability for two reasons. The first is that it is *extremely* rare for a person to develop retrograde amnesia in the absence of anterograde amnesia as a result of a brain disease or injury. The second is that claimed retrograde amnesia in the absence of anterograde amnesia is a common presentation of feigned memory impairment. Consequently, the Subcommittee intended to emphasize anterograde memory impairment in the definition of this ability.

Attention & distractibility refer primarily to the ability to focus attention and resist distraction. The Subcommittee recognizes that this partially overlaps the ability to persist in working at a task, but construed the latter as placing greater demands on the ability to stay engaged over days to weeks. The description of this ability is intended to emphasize the capacity to focus attention despite environmental or internal distractions.

Processing speed refers to how quickly a person can process *simple* information, such as judging whether two numbers are the same. Simple processing speed has been found to account for variability in how well people perform many everyday activities, including untimed tasks. Individual differences in processing speed can be measured quickly and reliably with pencil-and-paper or computerized tests, but they generally are not observable at the behavioral level. Consequently, the Subcommittee notes that it would be particularly important to determine how reliably this ability can be rated from medical records, and whether such ratings have predictive validity.

Executive functioning probably does not represent a unitary ability, as is apparent in its description. Because of this, it might be impossible to assess executive functioning with a single measure. The Subcommittee recommends including it because measures of executive functioning predict work outcomes among persons with mental disorders. Clinical performance-based tests of executive functioning, such as the Trail Making Test, Tower of London, and Stroop Color-Word Test, frequently are timed and thereby conflate the assessment of executive functions with processing speed and attentional

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demands. In addition, it should be noted that behavioral ratings and performance-based tests of executive functioning rarely show significant statistical correlation in studies that administer both types of measures to the same participants.

Attendance/Punctuality refers to the ability to leave one's residence, attend work regularly, and be punctual within customary tolerances. This corresponds to Item 7 on Form SSA-4734-F4-SUP. As noted above, there was widespread agreement among the Roundtable participants that this item be retained.

Initiative refers to the ability to start and perform tasks once they are explained without an unusual level of supervision. The wording of this item's description was intended to emphasize both the ability to initiate tasks once they are understood, and the extent to which a person is capable for working independently. While the ability to initiate work is not represented on the existing MRFC assessment, the ability to perform understood tasks without special supervision corresponds to Item 8 on Form SSA-4734-F4-SUP.

Pace/Persistence involves the ability to perform understood tasks at an acceptable pace for a week without excessive breaks. This corresponds to Item 11 on Form SSA-4734-F4-SUP. Again, despite the fact that this ability clearly is multiply-determined and therefore susceptible to impairment by many different factors, there was widespread agreement that this ability should remain in a revised MRFC assessment because it is sensitive to longitudinal fluctuations in everyday functional competence.

Cooperation refers to freedom from interpersonal friction. Impairments of this ability can take the form of argumentativeness, excessive sensitivity, suspiciousness, hostility, etc. The current MRFC includes several items (12, 14, & 15) that aim to separately assess interpersonal difficulties with supervisors, coworkers, and the general public. While the Subcommittee realizes that occupations differ in the nature, frequency, and closeness of interpersonal contact they entail, there is little reason to believe that mental disorders or injuries impair a person's ability to cooperate with specific *classes* of people (e.g., only coworkers).

Response to criticism refers to the ability to accept instruction, directions, and criticism from others. This corresponds to Item 14 on Form SSA-4734-F4-SUP, which frames the ability solely in relation to instruction or criticism by supervisors. The Subcommittee again recommends broadening this item to assess one's ability to accept instruction and respond appropriately to criticism, regardless of its source.

Social cognition refers to abilities that enable people to respond appropriately to others. Closely aligned with the concept of emotional intelligence, social cognition is thought to depend on a person's ability to interpret nonverbal communication, empathize with others, and recognize when another person's point of view differs from one's own. The current MRFC assessment does not capture social cognition, and the Subcommittee recommends adding it because several mental disorders and injuries can impair social cognition, and thereby disrupt normal social and emotional reciprocity.

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Personal hygiene involves the ability to maintain an acceptable level of personal cleanliness, grooming, and socially appropriate attire. This largely overlaps Item 16 on Form SSA-4734-F4-SUP, but adds the element of wearing socially appropriate attire. The rationale for this addition is that occupations vary not only in what level of personal hygiene is acceptable, but also in the extent to which employees are expected to recognize and don attire that is acceptable in the work environment.

Symptom control refers to a person's ability to inhibit the expression of disturbing symptomatic behaviors, such as loud or pressured speech, vocal tics, extreme mood swings, or responding to hallucinations. The Subcommittee recommends adding this item because of wide variation in how completely and consistently persons with mental disorders can control the manifestation of symptomatic behaviors. Likewise, it is recognized that occupations likely differ in how much disturbing behaviors are tolerated.

Self-monitoring refers to a person's ability to monitor and evaluate the quality of his own task performance. The Subcommittee recommends adding this item because mental disorders and injuries can impair a person's ability to perceive the accuracy of his or her own task performance, especially when tasks require precision.

In addition to these 15 core psychological and interpersonal abilities that are recommended for assessment in a revised MRFC assessment, several others were nominated but not included. Because the SSA might later consider adding one or more of these, a brief discussion of the Subcommittee's rationale for rejecting these items is offered next.

Several Roundtable participants and end users suggested that the revised MRFC should assess Judgment. The major reason this does not appear on the list of abilities recommended for inclusion is that the underlying construct is difficult to define, and the Subcommittee doubts that it can be reliably assessed. If the SSA decides to continue relying primarily on informant ratings (as it does now), isolated incidents that appear to involve poor judgment are likely to be weighted excessively by some adjudicators and dismissed by others. Wearing insufficient clothing in cold weather, failing to look both ways before crossing the street, giving money to a swindler, having an extramarital affair, driving while intoxicated, spending money excessively, smoking cigarettes despite having emphysema, driving while using a cellular phone, and criticizing one's supervisor could all be construed as failures of judgment. However, (1) they are likely to have very different consequences, (2) their impact on the ability to work are likely to vary enormously, and (3) they could all be attributed to factors other than judgment, per se (e.g., cognitive impairment, addiction, etc.). For these reasons the Subcommittee decided not to recommend that the revised MRFC attempt to assess judgment.

Others suggested that the ability to modulate mood or regulate emotion be included in a revised MRFC assessment. In fact, the Subcommittee did add an item (14) that is intended to assess a person's ability to inhibit the expression of symptomatic behavior, which certainly could include severely depressed, elated, or angry mood states. However, the reason a separate rating of mood state was not included in the list of

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recommended abilities for MRFC assessment is that feeling sad or depressed does not, in itself, preclude the ability to work. Many people work despite suffering from sadness, despair, anxiety, or hopelessness. Rather, it is only when depression causes one to neglect personal hygiene, not get out of bed, lose focus on tasks, slow down one's thinking, or stop avoid required interactions with coworkers that difficulty modulating one's mood impairs the ability to work. Thus, this item was not thought to convey useful incremental information above and beyond those recommended in the core list.

A third ability suggested for inclusion is stress tolerance. After beginning a job, persons with mental disorders often find work increasingly stressful. Over time they might worry that coworkers dislike them, develop insomnia, or stop taking prescribed medications. If the person comes to work late and gets reprimanded, he or she might quit rather than respond adaptively. While the factors leading to such job failures can vary enormously, persons with mental disorders often are less able to cope effectively with stressors than psychologically healthy adults. Although only one Roundtable participant nominated stress tolerance for inclusion in a revised MRFC assessment, the Subcommittee recommends that the Panel urge SSA to consider the *possibility* of adding it to the list of 15 items. However, the Subcommittee was not prepared to make this recommendation for several reasons. First, because poor stress tolerance usually manifests as a series of maladaptive responses to stressors, reliable assessment of it almost certainly would require longitudinal data. Second, poor stress tolerance is very difficult to define in operational terms. Third, stressors that lead to decompensation among persons with low stress tolerance due to neuropsychiatric impairment probably have very little to do with job demands, per se. More often, they have to do with problems outside the work place, such as family conflicts, or than involve illness-related internal conflicts. For this reason, while illnesses and injuries can impair a person's stress tolerance, it is precisely because they can lead to unexpectedly severe reactions to idiosyncratic stressors and seemingly trivial events that it may be impossible to establish any correspondence between this ability and the demands of work.

Recommendation 4: The Subcommittee recommends that the Panel provide ongoing consultation to the OIS Project's psychometrician as the SSA develops items for data collection. More generally, the Subcommittee recommends that the SSA consider the possibility that MRFC abilities be assessed using different methods (e.g., informant ratings for some, performance-based measures for others) and different scales (e.g., Likert, behaviorally-anchored ratings, percentiles, etc.) for different categories of psychological and interpersonal abilities.

Recommendation 5: Finally, the Subcommittee recommends a series of studies to examine the reliability and predictive validity of any instruments developed to assess residual functional capacities and occupational demands as part of the OIS Project. The recommended studies are described in greater detail below.

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Suggested Studies

The Subcommittee recommends that the SSA conduct a series of studies and data analyses. Before describing these, the Subcommittee notes that the SSA compiled a document entitled “Data on the top 100 Occupations by Employment for 2008 and Projected 2016.” One table in this document shows the top 100 occupations by total persons employed for 2008 based on the *Household Data Annual Averages*. These data were drawn from the Current Population Survey, a monthly survey conducted by the Bureau of Census for the BLS. The top 100 occupations are based on SOC levels. A few represent occupational titles that encompass more than one detailed occupation. The occupations are ranked by the total employed (in thousands). Approximately 65% of persons in the U.S. labor force work in one of these 100 occupations. A reformatted version of this table appears below.

Occupation (Standard Occupational Classification)	Total Employed (Thousands)	Occupation (Standard Occupational Classification)	Total Employed (Thousands)
Managers, all other (managers not listed separately)	3,473	Medical assistants and other healthcare support occupations	831
First-line supervisors/managers of retail sales workers	3,471	Education administrators	829
Retail sales persons	3,416	Human resources, training, and labor relations specialists	803
Driver/sales workers and truck drivers	3,388	Hairdressers, hairstylists, and cosmetologists	773
Secretaries and administrative assistants	3,296	Farmers and ranchers	751
Cashiers	3,031	Other teachers and instructors	751
Elementary and middle school teachers	2,958	Inspectors, testers & sorters	751
Registered nurses	2,778	Management analysts	731
Janitors and building cleaners	2,125	Social workers	729
Waiters and waitresses	2,010	Food preparation workers	724
Cooks	1,997	Miscellaneous agricultural workers	723
Customer service representatives	1,908	Preschool & kindergarten teachers	685
Nursing, psychiatric, and home health aides	1,889	Counselors	674
Laborers and freight, stock, and material movers, hand	1,889	Police and sheriff's patrol officers	674
Accountants and auditors	1,762	Bus drivers	651
Chief executives	1,655	Painters, construction & maint.	647
Construction laborers	1,651	First line supervisors/managers of food preparation and servers	635
First line supervisors/managers of office and administrative support workers	1,641	Pipelayers, plumbers, pipefitters, and steamfitters	606
Carpenters	1,562	Welding, soldering, & brazing workers	598
Stock clerks and order filers	1,481	Insurance sales agents	573
Maids and housekeeping cleaners	1,434	Industrial truck and tractor operators	568
Bookkeeping, accounting & auditing clerks	1,434	Licensed practical/vocational nurses	566
Receptionists and information clerks	1,413	Medical & health services managers	561

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Occupation (Standard Occupational Classification)	Total Employed (Thousands)	Occupation (Standard Occupational Classification)	Total Employed (Thousands)
Sales representatives, wholesale and manufacturing	1,343	Property, real estate, and community service managers	558
Child care workers	1,314	Office and administrative support workers, all other	558
First line supervisors/managers of non-retails sales workers	1,287	Shipping, receiving, and traffic clerks	543
Grounds maintenance workers	1,262	Computer programmers	534
Construction managers	1,244	Sales representatives & service	521
Postsecondary teachers	1,218	Billing and posting clerks and machine operators	516
Secondary school teachers	1,210	Computer & info systems managers	475
Office clerks, general	1,176	Tellers	466
Financial managers	1,168	Maintenance & repair workers	461
Miscellaneous assemblers and fabricators	1,050	Health diagnosing and treating practitioner support technicians	447
Food service managers	1,039	Clergy	441
Computer software engineers	1,034	Industrial machinery mechanics	439
Teacher assistants	1,020	Personal financial advisors	430
Lawyers	1,014	Network systems and data analysts	422
General and operations managers	985	Engineering technicians	416
Real estate brokers and sales agents	962	Data entry keyers	415
Production workers, all other	958	Machinists	409
Marketing and sales managers	922	Bailiffs, correctional officers & jailers	403
Physicians and surgeons	877	Operating engineers and other construction equipment operators	398
Electricians	874	Heating, air conditioning, and refrigeration mechanics	397
First line supervisors/managers of productions and operating workers	874	Loan counselors and officers	392
Personal and home care aids	871	Packers and packagers, hand	391
Security guards & gaming surveillance officers	867	Securities, commodities, and financial services agents	388
Automotive service techs & mechanics	852	Special education teachers	387
First line supervisors/managers of construction trades and extraction workers	844	Computer support specialists	382
Computer scientists and systems analysts	837	Postal service mail carriers	373
Designers	834	Taxi drivers and chauffeurs	373

Although not shown in this report, the manual for the Wonderlic Personnel Test (WPT; 1992) includes a figure that presents the mean and median scores of persons employed in 72 occupations. Attorneys, for example, produced the highest mean and median WPT scores, while packers produced the lowest WPT scores of the 72 occupational groups. Occupations that appear in the top 100 table were cross-referenced with the WPT figure. This revealed that the most common occupations in the

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United States are filled by individuals who represent a *very broad spectrum of general cognitive ability* based their WPT scores. This exercise suggests that occupational differences in the WPT or some other measure of *g* among successful job incumbents might serve as an ideal measure of overall job complexity.

Based on this reasoning, the Subcommittee recommends that the SSA conduct a study in which all of the revised physical and mental residual functional capacity measures are administered to a nationally representative sample of persons who have worked for at least 6 months (i.e., “successful” incumbents) in one of the 150 to 200 most common occupations in the U.S. economy. If 50 to 75 successful incumbents in each occupation are assessed, this will require 7,500 to 15,000 study participants.

By characterizing the physical and psychological abilities of a broadly representative sample of successful job incumbents using the measures developed for the OIS, it will be possible to arrange all 150–200 occupations hierarchically in terms of each person-side characteristic. By reflection, each such hierarchy can be interpreted to reflect the extent to which the underlying ability is required by each job. In this way, occupational demands for lifting could be arranged from most to least by comparing the maximum weight incumbents of each occupational group can actually lift when tested. Likewise, differences in job complexity could be defined by arranging the mean scores of job incumbents on some measure of *g* by occupational group. The occupation whose incumbents earn the highest mean score would be identified as demanding the most general cognitive ability. The occupation whose incumbents earn the lowest score would be identified as requiring the least general cognitive ability. By documenting the *distribution* of scores on each physical and psychological measure for all 150–200 occupations surveyed in this way, the SSA would be able to specify where any given disability applicant’s measured abilities fall in the distribution of abilities required by each occupation. The same principle would apply to every measured person-side characteristic and every job-side demand.

The results of this study could solve many problems. First, measuring the physical and psychological abilities of successful job incumbents would provide empirical data about the actual abilities required to perform each occupation. Second, by studying only the 150–200 most common occupations, residual abilities of claimants will be compared to the requirements of occupations that are widely available. (Based on the table above, it is likely that the top 150–200 occupations include at least 65% of all jobs in the U.S. economy.) Third, by assessing both physical and psychological abilities of successful job incumbents, the SSA would obtain critical information about the *demands* of specific occupations for linking with *patterns* of residual abilities shown by individual disability benefits. Fourth, this approach would greatly decrease the “inferential leap” currently required between residual functional capacities as assessed by the SSA and occupational demands as described in the DOT. Fifth, comparing the residual physical and mental abilities of persons who have been adjudicated as unable to work with the distributions of corresponding abilities among successful job incumbents could provide crucial scientific data to help the SSA determine what levels of RFC are too low to work in specific occupations. Finally, recording evidence about medical conditions that

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successful job incumbents have could provide quantitative data about what residual capacities enable persons with a medical condition to work.

In addition to this normative study, the Subcommittee recommends that a study be conducted of claimants for disability benefits and SSI/SSDI beneficiaries who have been adjudicated as unable to work. By administering the revised physical and mental residual functional capacity instruments along with the current instruments, the SSA will be able to determine which specific measures best distinguish individuals who are able to work (with or without medical conditions) and those who file disability claims and/or are adjudicated as disabled from working under current SSA rules.

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References

Becker, D. R., R. E. Drake, et al. (1998). "Job terminations among persons with severe mental illness participating in supported employment." Community Mental Health Journal **34**(1): 71-82.

Bond, G. R. and R. E. Drake (2008). "Predictors of competitive employment among patients with schizophrenia." Current Opinion in Psychiatry **21**(4): 362-369.

Purpose of review: Recently published studies examining predictors of competitive employment for patients with schizophrenia are reviewed. Recent findings: Researchers continue to examine predictors of employment among three types of variables: patient characteristics, environmental factors, and interventions. Provision of supported employment is the strongest predictor of competitive employment in this population, while patient predictors continue to show modest associations with outcomes. Environmental factors, including societal and cultural influence, local economy, labor laws, disability policies, and governmental regulations, are presumed to have major influences on employment, but these factors have been little studied. Summary: Given the strong and consistent evidence base for the effectiveness of supported employment in helping individuals with schizophrenia achieve competitive employment, mental health planners should make access to this practice a high priority. Barriers to implementation of supported employment, including finance, organization, integration, training, and supervision, need to be systematically addressed. The field currently lacks an adequate understanding of the role of societal, cultural, and regulatory factors in facilitating and hindering employment outcomes; such research is much needed. (PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

Bond, G. R. and M. H. Friedmeyer (1987). "Predictive validity of situational assessment at a psychiatric rehabilitation center." Rehabilitation Psychology **32**(2): 99-112.

Used situational assessment to predict employment outcomes for 77 individuals (mean age 24.5 yrs) attending a community psychiatric rehabilitation program. The assessment form was a 22-item checklist comprised of 4 dimensions: work readiness, work attitudes, interpersonal relations, and work quality. Ratings were made in 2 work settings: prevocational work crews and transitional employment. Situational assessment predicted outcome better than did work history. Staff ratings were significantly higher for Ss working in transitional employment, although ratings made in both settings were predictive of later employment outcomes. It is concluded that situational assessment may be a method better suited for screening out members who have poor work potential than selecting members who will definitely succeed. (PsycINFO Database Record (c) 2009 APA, all rights reserved)

Bruyere, S. M. (2005). "Using the International Classification of Functioning, Disability and Health (ICF) to promote employment and community integration in rehabilitation." Rehabilitation Education **19**(2): 105-117.

The current varied definitions of disability and successful outcomes of rehabilitation service delivery make comparisons across service systems difficult in most cases. The World Health Organization's International Classification of Functioning, Disability and Health (ICF) has the potential to assist vocational rehabilitation administrators, policymakers, and practitioners with creating a transferable conceptual framework for defining indicators of successful outcomes in the integration of persons with disabilities into the workforce and community. This article provides a review of selected literature on applications of the ICF to medical rehabilitation,

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employment, and community participation for persons with disabilities. In addition, the next steps to make better use of this framework in applications to vocational rehabilitation service delivery, counselor education, and research are discussed. (PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

Bruyere, S. M., S. A. Van Looy, et al. (2005). "The International Classification of Functioning, Disability and Health: Contemporary Literature Overview." *Rehabilitation Psychology* **50**(2): 113-121.

This article reviews the literature from the 3 years since the International Classification of Functioning, Disability and Health's (ICF's) endorsement, focusing on those articles that discuss (a) what the ICF means and how it can be used; (b) the general utility of the ICF for specific fields, such as nursing, occupational therapy, speech-language pathology, and audiology; (c) examples of applications for classification in particular disorders, such as chronic health conditions, neuromusculoskeletal conditions, cognitive disorders, mental disorders, sensory disorders, and primary and secondary conditions in children; (d) uses of the ICF to recode prior work across multiple surveys and across country coding schemes on disability-related national survey items; and (e) governmental uses of the ICF in the United States and selected countries abroad. Future directions needed to effectively implement the ICF across rehabilitation policy, research, and practice are discussed. (PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

Burkhauser, R. V., J. S. Butler, et al. (2001). "How policy variables influence the timing of applications for Social Security Disability Insurance." *Social Security Bulletin* **64**(1): 52-83.

This article analyzes the impact of policy variables--employer accommodations, state Social Security Disability Insurance (DI) allowance rates, and DI benefits--on the timing of an application for DI benefits by workers with a work-limiting health condition starting when their health condition first begins to bother them. The analysis uses a rich mixture of personal and employer characteristics from the Health and Retirement Study linked to Social Security administrative records. We find that most workers do not apply immediately for DI benefits when they are first bothered by a health condition. On the contrary, the median working-age man with a work-limiting condition waits 7 years after that time before applying, and the median working-age woman waits 8 years. Although the risk of applying for benefits is greatest in the year following onset, only 16 percent of men and 13 percent of women in our sample apply within the first year, and the risk of application falls thereafter. That finding suggests that institutional factors, in addition to health factors, may play a role in the timing of DI applications. Using kernel density estimates of the distribution of application and nonapplication ordered by state allowance rates (the rate of acceptance per DI determination in each state), we find that both men and women who live in states with high allowance rates are disproportionately more likely to apply for benefits in the first year after their condition begins to bother them than are those in states with low allowance rates. Using life-table analysis, we also find that men and women who are accommodated by their employers are significantly less likely to apply for DI benefits in each of the first few years after their condition begins to bother them than are those who are not accommodated. On the basis of this evidence, we include these policy variables in a model of the timing of DI application that controls for other socioeconomic variables as well as health. Using a hazard model, we find that workers who live in states with higher allowance rates apply for DI benefits significantly sooner than those living in states with lower allowance rates following the onset of a work-limiting health condition. Workers who are accommodated

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following the onset of a work-limiting health condition, however, are significantly slower to apply for DI benefits. Using the mean values of all explanatory variables, we estimate the relative importance of changes in these policy variables on the speed with which workers apply for benefits after onset. We find that the mean time until application for men is 10.22 years. Universal accommodations following onset would delay application by 4.36 years. In contrast, a 20 percent decrease in state allowance rates would delay application by only 0.88 years. For working-age women, the average expected time until application once a condition begins to bother them is 10.58 years. Universal accommodations would delay that by 3.76 years, and a 20 percent decrease in allowance rates would delay it by 1.47 years. A complication in this analysis is that the policy variables are to some degree endogenous. Accommodation is probably offered more often to workers who want to continue working. Allowance rates are chosen by states on the basis of federal policy and local choices and probably in part on the health condition of workers in the state. Therefore, our estimates are upper bounds of these policy effects. Still, we believe we provide evidence that the social environment faced by workers with work-limiting health conditions can significantly influence their decision to apply for DI benefits, holding their specific health conditions constant.

Desmarais, L. B. and P. R. Sackett (1993). "Investigating a cognitive complexity hierarchy of jobs." Journal of Vocational Behavior **43**(3): 279-297.

Investigated the construct validity of the Occupational Aptitude Patterns (OAP) Map, an occupational classification system based on ability requirements, by placing the positions held by a large, nationally representative sample of full-time employed, young, civilian adults into the classification system. Results largely supported the OAP Map structure. The OAP Map captured differences across jobs in their requirements for general cognitive ability, although the overlap across job clusters was large. The Map differentiated jobs also on the basis of their requirements for specific abilities (e.g., scientific/mechanical ability), once the effects for general cognitive ability requirements were taken into account. (PsycINFO Database Record (c) 2009 APA, all rights reserved)

Dickinson, D., A. S. Bellack, et al. (2007). "Social/communication skills, cognition, and vocational functioning in schizophrenia." Schizophrenia Bulletin **33**(5): 1213-20.

Deficits in social/communications skills have been documented in schizophrenia, but it is unclear how these deficits relate to cognitive deficits and to everyday functioning. In the current study, social/communication skills performance was measured in 29 schizophrenia patients with a history of good vocational functioning (GVF) and 26 with a history of poor vocational functioning (PVF) using a role-play-based social skills assessment, the Maryland Assessment of Social Competence (MASC). A battery of standard cognitive tasks was also administered. MASC-indexed social skills were significantly impaired in PVF relative to GVF patients (odds ratio = 3.61, $P < .001$). Although MASC social skills performance was significantly associated with cognitive performance in domains of verbal ability, processing speed, and memory, the MASC nevertheless remained an independent predictor of vocational functioning even after controlling for cognitive performance. Social/communications skills predict vocational functioning history independently of cognitive performance, and social skills measures should be considered for inclusion in test batteries designed to predict everyday functioning in schizophrenia.

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Fraser, R. T. and D. C. Clemmons (2000). Traumatic brain injury rehabilitation: Practical vocational, neuropsychological, and psychotherapy interventions. Boca Raton, FL US, CRC Press.

This book presents innovative guidelines for allied health members of the traumatic brain-injury rehabilitation team with information to help achieve more successful vocational and psychosocial outcomes. It provides a clear overview of critical components of neuropsychological information and the use of this information in vocational planning; examples of functional areas of cognition and neuropsychological assessment; the linkages between cognitive and behavioral impairments; the different categories of assistive technology; psychotherapy and behavioral interventions as well as successful vocational interventions; and models of work access, including methods of supported employment, the development of a tailored job coaching program, and the specifics of utilizing natural supports. This book is useful to anyone involved in neurorehabilitation, vocational rehabilitation, rehab psychology, neuropsychology, and students in counseling programs or studying medical aspects of disability. (PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the cover)

Fraser, R. T., E. Johnson, et al. (In press). Using neuropsychological information in vocational planning: perspective for clinical practice. A practical guide to neuropsychological testing for patients, practitioners and other professionals. E. Arzubi and E. Mambrino. New York, Springer Publishing Company.

This chapter provides a practical overview of the benefits of using neuropsychological testing in vocational rehabilitation planning. A major emphasis of the chapter is on the interplay between neuropsychologists and vocational rehabilitation staff in optimizing the utility of the neuropsychological report in the work planning effort.

Fraser, R. T., D. Vandergoot, et al. (2004). "Employment outcomes research in vocational rehabilitation: Implications for Rehabilitation Counselor (RC) training." Journal of Vocational Rehabilitation **20**(2): 135-142.

This paper reviews salient categories of rehabilitation programs' employment outcomes research, as recently presented by the authors at the May 2002 "Bridging Gaps" conference, sponsored by the National Institute of Disability and Rehabilitation Research (NIDRR) and the Office of Special Education and Rehabilitation Services (OSERS), US Department of Education and several co-sponsors (e.g., the American Psychological Association/Rehabilitation Psychology, Division 22, etc.). The purpose of this paper is to review these findings and draw the most relevant implications for rehabilitation counselor training programs' curricula. The paper begins with a review of the contextual changes affecting vocational rehabilitation (VR) services delivery today and then presents employment outcomes research findings as related to the vocational rehabilitation participant, the rehabilitation counselor in the placement process, and the actual services provided. Implications for rehabilitation counseling curricula are presented not only in relation to job placement coursework, but also coursework relating to counseling strategies, vocational assessment, and medical aspects of disability. Modifications to coursework in the above areas (and potentially others) should have impact in preparing more of an "employment outcomes skilled and oriented" RC program graduate. (PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

Frey, W. D., S. T. Azrin, et al. (2008). "The Mental Health Treatment Study." Psychiatric Rehabilitation Journal **31**(4): 306-312.

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Social Security Disability Insurance (SSDI) beneficiaries with primary psychiatric impairments comprise the largest, fastest growing, and most costly population in the SSDI program. The Mental Health Treatment Study provides a comprehensive test of the hypothesis that access to evidence-based employment services and behavioral health treatments, along with insurance coverage, can enable SSDI beneficiaries with psychiatric impairments to return to competitive employment. It will also examine which beneficiaries choose to enter an employment study under such conditions. Currently in the field in 22 cities across the U.S., the MHTS aims to recruit 3,000 SSDI beneficiaries with psychiatric impairments into a randomized controlled trial. This paper describes the MHTS, its background, and its process and outcome assessments. (PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

Gold, J. M., R. W. Goldberg, et al. (2002). "Cognitive correlates of job tenure among patients with severe mental illness." American Journal of Psychiatry **159**(8): 1395-402.

OBJECTIVE: There is clear evidence that cognitive performance is a correlate of functional outcome among patients with schizophrenia. However, few studies have specifically examined the cognitive correlates of competitive employment performance or the longer-term outcomes of vocational rehabilitation. The objective of the present study was to examine the cognitive predictors of vocational functioning in the context of a controlled clinical trial by comparing two approaches to vocational rehabilitation. **METHOD:** A broad neuropsychological battery was administered to 150 patients upon entry into the vocational rehabilitation trial. Vocational performance was assessed over a 24-month follow-up interval. **RESULTS:** There were no differences in baseline cognitive performance between the 40 patients who obtained competitive employment and the 110 patients who remained unemployed over the follow-up interval. In contrast, multiple cognitive measures were significantly correlated with the total number of hours that patients were employed. The cognition-job tenure relationship appears to be fairly general, involving measures of IQ, attention, working memory, and problem solving. **CONCLUSIONS:** Cognitive performance was a significant predictor of job tenure but not job attainment in the context of a clinical trial of two vocational rehabilitation approaches. It appears that many persistently unemployed patients are capable of obtaining competitive employment with effective vocational services. Longer-term employment success, however, may be related to multiple aspects of baseline cognitive performance.

Gold, J. M., C. Queern, et al. (1999). "Repeatable battery for the assessment of neuropsychological status as a screening test in schizophrenia I: sensitivity, reliability, and validity." American Journal of Psychiatry **156**(12): 1944-50.

OBJECTIVE: Cognitive impairment is an important feature of schizophrenia and is correlated with functional outcome. However, psychiatry lacks a screening instrument that can reliably assess the types of cognitive impairment often seen in schizophrenia. The authors assessed the sensitivity, convergent validity, and reliability of the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) as well as the relationship of the RBANS to symptoms and employment status. This newly published test takes 25 minutes to administer and was standardized on a U.S.-Census-matched adult population. The test provides a total score and five index scores, each with a mean value of 100 (SD = 15). **METHOD:** RBANS data were obtained from 129 patients with schizophrenia in the outpatient and inpatient programs of the Maryland Psychiatric Research Center. RBANS data were correlated with WAIS-III and Wechsler Memory Scale, 3rd ed. performance in 38 patients. Reliability data for alternate forms of the RBANS were

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obtained from 53 patients; symptom ratings were obtained from 48 patients; and employment status was examined in 77 patients. RESULTS: The patients with schizophrenia demonstrated marked impairment on the RBANS (their mean total score was 71.4). The patients' index scores suggested that they had relatively less impairment of language and visual functions than of memory and attention. The RBANS demonstrated high correlations with full-scale IQ and memory measures. The total score demonstrated good reliability. RBANS performance minimally correlated with Brief Psychiatric Rating Scale ratings but was strongly related to employment outcome. CONCLUSIONS: The RBANS appears to be a useful cognitive screening instrument in schizophrenia. The instrument may be a useful prognostic indicator and offers a means of assessing cognitive status.

Gottfredson, L. S. (1986). "Occupational Aptitude Patterns Map: Development and implications for a theory of job aptitude requirements." Journal of Vocational Behavior **29**(2): 254-291.

Used US Employment Service data on the cognitive and noncognitive aptitude requirements of different occupations to create an occupational classification, "the Occupational Aptitude Patterns Map (OAPM)," of 13 job clusters arrayed according to major differences in overall intellectual difficulty level and in functional focus (field) of work activities. The OAPM was compared with an alternative, aptitude-based classification; with J. L. Holland's (1985) typology of work environments; and with ratings for complexity of involvement with data, people, and things. Those comparisons supported the construct validity of different aspects of the OAPM and helped clarify uses for which it is most appropriate. It is concluded that when combined with previous evidence about patterns of job aptitude demands, the OAPM provides the basis for a theory of job aptitude requirements. The OAPM and accompanying analyses support the following hypotheses: (1) General intelligence is the major gradient by which aptitude demands have become organized across jobs in the US economy; (2) within broad levels of work, the aptitude demands of different fields of work differ primarily in the shape of their cognitive profiles; and (3) different aptitude demand patterns arise in a large part from broad differences in the tasks workers actually perform on the job. (45 ref) (PsycINFO Database Record (c) 2009 APA, all rights reserved)

Gottfredson, L. S. (2002). "Where and why g matters: Not a mystery." Human Performance **15**(1): 25-46.

Explains g as being the highly general capability for processing complex information of any type, explaining its value in predicting job performance. And, as complexity is the major distinction among jobs, g is more important further up the occupational hierarchy. The author discusses the generalizability and stability of the g factor, its meaning as a construct, and the complexity factor among jobs. (PsycINFO Database Record (c) 2008 APA, all rights reserved)

Harding, B., S. Torres-Harding, et al. (2008). "Factors associated with early attrition from psychosocial rehabilitation programs." Community Mental Health Journal **44**(4): 283-288.

This study aimed to identify characteristics associated with early dropout from a vocationally oriented psychosocial rehabilitation (PSR) program for clients with severe mental illness. The sample consisted of 194 individuals who participated in a study comparing a supported employment program to a stepwise vocational program. Study participants who dropped out of the PSR program within 6 months of study entry were compared to those who continued for at least 6 months. Dropouts had poorer competitive employment outcomes than those who continued. Participants with at least a high school diploma, never married, with a schizophrenia-

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spectrum diagnosis, and those assigned to a stepwise model of vocational rehabilitation were more likely to dropout. The implications of these findings are discussed. (PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

Heitzman, A. M., J. M. Meltzer, et al. (2009). "A call to update the DOT: Findings of the IARP Occupational Database Committee." The Rehabilitation Professional **17**(2): 63-84.

Lerner, D., B. C. Amick, III, et al. (2003). "Relationship of employee-reported work limitations to work productivity." Medical Care **41**(5): 649-659.

Work limitation rates are crucial indicators of the health status of working people. If related to work productivity, work limitation rates may also supply important information about the economic burden of illness. Our objective was to assess the productivity impact of on-the-job work limitations due to employees' physical or mental health problems. Subjects were asked to complete a self-administered survey on the job during 3 consecutive months. Using robust regression analysis, we tested the relationship of objectively-measured work productivity to employee-reported work limitations. Each survey included a validated self-report instrument, the Work Limitations Questionnaire (WLQ). The firm provided objective, employee-level work productivity data. In adjusted regression analyses (n=1,827), employee work productivity (measured as the log of units produced/hour) was significantly associated with 3 dimensions of work limitations: limitations handling the job's time and scheduling demands, physical job demands, and output demands. For every 10% increase in on-the-job work limitations reported on each of the 3 WLQ scales, work productivity declined approximately 4 to 5%. Employee work limitations have a negative impact on work productivity. (PsycINFO Database Record (c) 2009 APA, all rights reserved)

Lerner, D., B. C. Amick, III, et al. (2001). "The Work Limitations Questionnaire." Medical Care **39**(1): 72-85.

Developed and assessed psychometric properties of a questionnaire for measuring on-the-job impact of chronic health problems and/or treatment (work limitations). Three pilot studies (focus groups, cognitive interviews, and an alternate forms test) generated candidate items, dimensions, and response scales. Two field trials (Studies 1 and 2) tested test recall error and construct validity of the questionnaire. Ss were employed individuals (aged 18-64 yrs) from several chronic condition (e.g., arthritis, headache, epilepsy) groups (48 in Study 1, 121 in Study 2) and 14 healthy controls (Study 1). With 25 items, 4 dimensions (limitations handling time, physical, mental-interpersonal, and output demands), and a 2-wk reporting period, the Work Limitations Questionnaire demonstrated high reliability and validity. (PsycINFO Database Record (c) 2009 APA, all rights reserved)

MacDonald-Wilson, K., E. S. Rogers, et al. (2001). "Unique issues in assessing work function among individuals with psychiatric disabilities." Journal of Occupational Rehabilitation **11**(3): 217-232.

With the admission of people who experience psychiatric disabilities in the state-federal vocational rehabilitation system and the Social Security disability rolls in the 1960s, assessment of their capacity to work has been a major concern. Given the rising rates of claims for psychiatric disability in both the public and the private sectors, and the disappointing employment outcomes of people with psychiatric disabilities compared to those with other disabilities, there have been numerous initiatives to accurately assess their employment

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potential. Historically, such assessment within the Social Security Administration has relied upon evaluation of a person's medical impairment, but numerous studies suggest a weak relationship between measures of psychiatric diagnosis or symptoms and work outcome. Efforts have been undertaken to identify valid and reliable methods of assessing the ability of people with psychiatric disabilities to work. The authors review (a) methods of assessing work function for this population, and (b) the literature on predictors of work functioning and the nature of psychiatric disability, and suggest implications for disability determination policies and for future research. (PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

MacDonald-Wilson, K. L., E. S. Rogers, et al. (2003). "Identifying relationships between functional limitations, job accommodations, and demographic characteristics of persons with psychiatric disabilities." Journal of Vocational Rehabilitation **18**(1): 15-24.

Years after the passage of the Americans with Disabilities Act, little empirical information exists about the relationship between the functional limitations experienced by individuals with psychiatric disabilities, and related reasonable accommodations provided on the job. A multi-site, longitudinal study was conducted with 191 employees in 22 supported employment programs across 3 states during a 1-year study period. Data were gathered prospectively in a structured, narrative form designed to describe both the functional limitations and accommodations of participants. The most frequent functional limitations among this group of employed persons with psychiatric disabilities were cognitive in nature, followed by social, physical, and emotional/other. There was a significant relationship between the type of functional limitation and the number and type of accommodations received. There was a marginally significant relationship between type of functional limitation and a diagnosis of schizophrenia. There were no significant relationships between any other clinical or demographic factors, functional limitations or reasonable accommodations. Cognitive limitations were the most prevalent in this sample and the best predictor of the number of accommodations provided. (PsycINFO Database Record (c) 2009 APA, all rights reserved)

MacDonald-Wilson, K. L., E. S. Rogers, et al. (2002). "An investigation of reasonable workplace accommodations for people with psychiatric disabilities: quantitative findings from a multi-site study." Community Mental Health Journal **38**(1): 35-50.

Despite the requirement of many employers to provide accommodations in the workplace for individuals with disabilities under Section 504 of the Rehabilitation Act of 1973, the preponderance of accommodations that have been described in the literature concern physical rather than psychiatric disabilities. This study was an exploratory, descriptive, longitudinal, multi-site investigation of reasonable workplace accommodations for individuals with psychiatric disabilities involved in supported employment programs. We discuss the functional limitations and reasonable accommodations provided to 191 participants and the characteristics of 204 employers and 22 service provider organizations participating in the study. Implications for service providers and administrators in supported employment programs are discussed.

Mak, D. C. S., H. W. H. Tsang, et al. (2006). "Job Termination Among Individuals with Severe Mental Illness Participating in a Supported Employment Program." Psychiatry: Interpersonal and Biological Processes **69**(3): 239-248.

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This study, which explored job terminations among 60 individuals with severe mental illness participating in a supported employment program in Hong Kong, used the Chinese Job Termination Interview that was validated and translated from the Job Termination Interview (JTI; Becker, Drake, Bond et al., 1988). More than half of the job terminations (53%) were unsatisfactory which included dissatisfaction with job (44%) and lack of interest (22%). Modification of work schedules and provision of adequate supervision and coaching at the workplace were identified as necessary job accommodations. Similarities and differences of findings were compared with overseas studies. Possible improvement of current supported employment program was discussed. (PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

Massel, H. K., R. P. Liberman, et al. (1990). "Evaluating the capacity to work of the mentally ill." Psychiatry: Journal for the Study of Interpersonal Processes **53**(1): 31-43.

Ss were grouped into categories of psychotic (n = 79) or nonpsychotic (n = 64), and disabled or nondisabled, in regard to adjudication for mental impairment from the Social Security Administration (SSA). Ss were evaluated for their work capacity in either a 3- or 15-day vocational assessment. There were significant relationships between disability status and work capacity, in the direction of better performance for nondisabled Ss. Ss who were adjudicated appeared to be more work incapacitated than Ss who were not so adjudicated. Findings reflected concordance between the evaluation procedure and the SSA's disability determination process. (PsycINFO Database Record (c) 2009 APA, all rights reserved)

Matheson, L. N. (2001). "Disability methodology redesign: considerations for a new approach to disability determination." J Occup Rehabil **11**(3): 135-42.

Disability determination meets important societal needs, involving billions of dollars and millions of people every year. However, disability determination decisions often are incorrect, and the high proportion of decision appeals and reversals creates additional administrative expense and difficulty for the people that the disability determination system is intended to support. Projects funded by the United States Social Security Administration explored these issues and developed new conceptual models and tools to improve the accuracy and fairness of disability determination. This paper provides an introduction to the projects and the papers in this special issue of the Journal of Occupational Rehabilitation.

Matheson, L. N., M. Kane, et al. (2001). "Development of new methods to determine work disability in the United States." J Occup Rehabil **11**(3): 143-54.

The development of new methods to determine work disability for the United States Social Security Administration is described, including the fiscal and administrative background to the current and proposed methods. An introduction to the current disability determination process and description of its status is followed by a description of the original proposed plan for redesign of the process. In response to this plan, the authors participated in several research projects. An overview of some of the key research projects performed to improve the Social Security Administration disability determination process is provided.

Matheson, L. N., V. Kaskutas, et al. (2001). "Development of a database of Functional Assessment Measures related to work disability." Journal of Occupational Rehabilitation **11**(3): 177-199.

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The development of the Functional Assessment Measures Database is described. The database provides a method to organize and search for measures that are used to assess the functional abilities of people with medical impairments to determine work disability. Although there are several large collections of information about tests, questionnaires, structured interviews, and other measures used in medicine, psychology, and education, there is no central repository of information about the functional assessment measures that are used in rehabilitation. A team of experts in functional assessment, psychology, medicine, occupational therapy, and physical therapy was composed. The project identified 4,200 different measures that are used in the functional assessment of persons with disability across the life span, 812 of which are used to evaluate adults in terms of work disability. The database has 3,033 scales that are found in 633 measures. In the database, each measure is described and is linked to at least one functional assessment construct. The use of the database in the Social Security Administration Redesign Project is described. Other possible uses for the database are presented. (PsycINFO Database Record (c) 2009 APA, all rights reserved)

McGuire, A. B., G. R. Bond, et al. (2007). "Situational assessment in psychiatric rehabilitation: A reappraisal." *Journal of Vocational Rehabilitation* **27**(1): 49-55.

Background: One widely-used approach in the vocational rehabilitation field is the situational work assessment, in which staff rate general worker behaviors relevant to any employment setting. The Work Behavioral Inventory (WBI) is a standardized situational assessment developed specifically for individuals with severe mental illness (SMI). Originally developed in a sheltered workshop environment, its application in community settings has not been studied. We examined the predictive validity for the WBI in a range of community and agency settings. **Methods:** Using a prospective longitudinal study, we assessed 52 clients with schizophrenia spectrum disorders newly enrolled in a vocational program at a psychiatric rehabilitation agency. Participants were followed for nine months and assessed every two months on the WBI. **Findings:** WBI ratings were unrelated to employment outcomes in the full sample at nine months. However, among participants who obtained paid employment at some time during follow-up, WBI ratings were positively associated with total wages earned, weeks worked, and paid hours worked. **Conclusions:** Situational assessment is a useful method for predicting employment outcomes for individuals with schizophrenia who obtain work. However, its utility in predicting initial job acquisition is uncertain. In addition, the limitations in the use of situation assessments in community employment settings raise questions about how it would be best adapted in programs implementing evidence-based supported employment. (PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

McGurk, S. R. and H. Y. Meltzer (2000). "The role of cognition in vocational functioning in schizophrenia." *Schizophr Res* **45**(3): 175-84.

Schizophrenia is associated with long-term unemployment. Cognitive dysfunction, rather than clinical symptoms, may be the most important factor in the ability to work for patients with this disorder. To evaluate the relationship of clinical symptoms and cognitive functioning to work status, thirty patients with schizophrenia, who were participants in a vocational rehabilitation program, were evaluated with a comprehensive neuropsychological battery and assessment of psychopathology. Subjects were classified as being in stable full-time, part-time or unemployed work status for at least a year. Univariate analysis indicated that patients who were working full-time were significantly better educated, more likely to be treatment-resistant, more likely to be

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treated with an atypical antipsychotic medication, had more positive symptoms, and were engaged in work tasks which were more cognitively complex than the part-time employed and unemployed work groups. An ANCOVA controlling for education demonstrated that the full-time employed group performed significantly better than the unemployed group on measures of executive functioning, working memory and vigilance; and significantly better than the part-time group on measures of vigilance and executive functioning. Although negative symptoms did not significantly relate to work status in the univariate analysis, a multiple regression indicated that negative symptoms, level of education, and executive functioning differentiated the work groups. These results suggest that poor premorbid function, negative symptoms and cognitive dysfunction are significantly associated with unemployment in schizophrenia.

McGurk, S. R. and K. i. T. Mueser (2006). "Strategies for coping with cognitive impairments of clients in supported employment." *Psychiatric Services* **57**(10): 1421-1429.

Objective: This study evaluated the strategies used by employment specialists to help clients in supported employment programs manage cognitive impairments that interfered with obtaining and keeping jobs. Methods: Twenty-five supported employment specialists were surveyed to identify strategies they used to help their clients cope with cognitive problems in the domains of attention, psychomotor speed, memory, and problem solving. Then, 50 employment specialists were surveyed to determine whether they used each of the different coping strategies generated in the first part of the study. For each strategy used, they rated how effective it was. Results: Employment specialists reported using a total of 76 different strategies for helping their clients cope with cognitive difficulties. The specialists reported using an average of 48 different coping strategies, which they rated on average as just below effective. Strategies for dealing with attention problems were rated as more effective than strategies used in the other three domains. The number of coping strategies that they reported using was significantly correlated with the perceived effectiveness of the strategies and the proportion of clients in their caseload who were working. Conclusions: Supported employment specialists were actively involved in helping clients cope with their cognitive impairments. Use of more strategies was correlated with specialists' greater perceived effectiveness of the strategies and with higher rates of working clients on their caseloads, although the reasons for these associations are unclear. Further research is needed to evaluate whether employment specialists' use of more strategies to help clients cope with cognitive problems contributes to better work outcomes. (PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

McGurk, S. R. and K. T. Mueser (2004). "Cognitive functioning, symptoms, and work in supported employment: a review and heuristic model." *Schizophr Res* **70**(2-3): 147-73.

OBJECTIVE: Supported employment has been shown to improve the employment outcomes of clients with severe mental illness (SMI), but many clients who receive this service still fail to achieve their vocational goals. There is a need to better understand how illness-related impairments interfere with work, and how supported employment services deal with those impairments in order to improve the employment outcomes of clients with SMI. METHOD: We conducted a review of research on the relationship between cognitive functioning, symptoms, and competitive employment in clients with SMI. Based on this review, we developed a heuristic model of supported employment that proposes specific interactions between cognitive factors, symptoms, vocational services, and employment outcomes. RESULTS: The review indicated that cognitive functioning and symptoms were strongly related to work in studies of general

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psychiatric samples. In studies of clients participating in vocational rehabilitation programs, associations between cognitive functioning, symptoms, and work were also present, but were attenuated, suggesting that vocational rehabilitation compensates for the effects of some cognitive impairments and symptoms on work. We describe a heuristic model of supported employment that posits specific and testable effects of cognitive domains and symptoms on vocational services and employment outcomes. CONCLUSIONS: Supported employment appears to work by compensating for the effects of cognitive impairment and symptoms on work. The model may serve as a guide for research aimed at understanding how supported employment works, and for developing supplementary strategies designed to improve the effectiveness and cost-effectiveness of supported employment services.

McGurk, S. R. and K. T. Mueser (2006). "Cognitive and clinical predictors of work outcomes in clients with schizophrenia receiving supported employment services: 4-year follow-up." Adm Policy Ment Health **33**(5): 598-606.

In a prior study we showed that cognitive functioning was a modest predictor of work and supported employment services over 2-years in 30 clients with schizophrenia, whereas symptoms were not (McGurk et al. (2003). *Psychiatric Services*, 58, 1129-1135). In order to evaluate whether the long-term provision of supported employment services reduced the impact of cognitive functioning on work, we examined the relationships between cognitive functioning and symptoms assessed after the initial 2 years of the program, and work and vocational services over the following 2 years (3-4 years after joining the program). Cognitive functioning was more predictive of work during the latter 2 years of the study than the first 2 years, and a similar but weaker pattern was present for the prediction of employment services. Symptoms remained weak predictors for both time periods. In addition, learning and memory and executive functions were strongly correlated with job task complexity during the 3-4 year follow-up, but not the 1-2 year follow-up, suggesting that employment specialists were able to improve their ability to match clients to jobs based on their cognitive skills. Furthermore, the specific associations between cognitive functioning, services, and work outcomes changed from years 1-2 to years 3-4, suggesting a dynamic interplay between these factors over the long-term, rather than static and unchanging relationships. The findings indicate that rather than supported employment services reducing the impact of cognitive functioning on long-term competitive work, the impact actually increases over time, suggesting that efforts to improve cognitive functioning (e.g., cognitive rehabilitation) may optimize employment outcomes in schizophrenia.

Penn, D. L., L. J. Sanna, et al. (2008). "Social cognition in schizophrenia: An overview." Schizophrenia Bulletin **34**(3): 408-411.

The purpose of this column is to provide an overview of social cognition in schizophrenia. The column begins with a short introduction to social cognition. Then, we describe the application of social cognition to the study of schizophrenia, with an emphasis on key domains (i.e., emotion perception, Theory of Mind, and attributional style). We conclude the column by discussing the relationship of social cognition to neurocognition, negative symptoms, and functioning, with an eye toward strategies for improving social cognition in schizophrenia. (PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

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Rogers, E. S., K. Sciarappa, et al. (1991). "Development and evaluation of situational assessment instruments and procedures for persons with psychiatric disability." Vocational Evaluation & Work Adjustment Bulletin **24**(2): 61-67.

Developed 2 instruments, a work adjustment skills scale and an interpersonal skills scale. Staff in 2 psychosocial programs were trained in the situational assessment procedures and in observation techniques. 50-63 yr old clients (with schizophrenia, schizo-affective, or depressive disorder) were selected to examine the psychometric properties of the instruments. Interrater reliability, test-retest reliability, internal consistency, and split-half reliability statistics were computed from the data collected. Results suggest high levels of reliability for the 2 instruments. Predictive validity and concurrent validity of the instruments were examined by following the clients for 1 yr postassessment. A discriminant analysis was performed to determine if the situational assessment predicted vocational outcome. Concurrent validity was determined by correlating Ss' scores on the 2 scales with the Griffiths' Work Behavior Scale. (PsycINFO Database Record (c) 2009 APA, all rights reserved)

Salyers, M. P., A. B. McGuire, et al. (2008). "What makes the difference? Practitioner views of success and failure in two effective psychiatric rehabilitation approaches." Journal of Vocational Rehabilitation **28**(2): 105-114.

The current study examined success in two vocational programs by interviewing practitioners in two philosophically different employment programs at a psychosocial rehabilitation agency. Practitioners' views of what constitutes success and factors facilitating success were analyzed using both qualitative and quantitative means. In general, practitioners viewed success as more than just obtaining a job, but maintaining employment over time and making life changes. Success was most often attributed to consumer motivation, and lack of success was attributed to mental health symptoms. Furthermore, practitioners from each program tended to view success in a manner consistent with their program's philosophy. (PsycINFO Database Record (c) 2009 APA, all rights reserved) (from the journal abstract)

Schultheis, A. M. and G. R. Bond (1993). "Situational assessment ratings of work behaviors: Changes across time and between settings." Psychosocial Rehabilitation Journal **17**(2): 107-119.

Evaluated staff ratings of work behaviors for 52 clients with serious mental illness participating in a community mental health center vocational program. There were 2 sites for job training: in-house work crews and a "handyman work crew" providing temporary, paid employment in the community. Contrary to expectations, clients declined significantly in their work performance over a 3-mo period. Moreover, when observed in the community work crews, clients were rated significantly higher than when observed in in-house crews. Findings are interpreted as reflecting a "demoralization effect" among clients working in the in-house setting after previously working in a paid community placement. (PsycINFO Database Record (c) 2009 APA, all rights reserved)

Tsang, H., B. Ng, et al. (2000). "Predictors of post-hospital employment status for psychiatric patients in Hong Kong: From perceptions of rehabilitation professionals to empirical evidence." International Journal of Social Psychiatry **46**(4): 306-312.

Compared the social vocational competence and psychosocial support of employed and unemployed psychiatric patients following discharge. 50 mental hospital patients (aged 17-55 yrs) were assessed concerning social vocational competence and psychosocial support. Results show that 3 mo following discharge employed Ss exhibited better psychosocial support and

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social vocational competence than did unemployed Ss. Employed and unemployed Ss did not differ in their medical history, work history, or demographic variables. (PsycINFO Database Record (c) 2009 APA, all rights reserved)

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Appendix A

Biographic Sketches of Subcommittee Members

David J. Schretlen, Ph.D., Chair

David J. Schretlen, Ph.D. is as an Associate Professor of Psychiatry and Behavioral Sciences, as well as an Associate Professor of Radiology at the Johns Hopkins University School of Medicine. He is board-certified in clinical neuropsychology, and works at the Johns Hopkins Hospital, where he sees patients, teaches, and conducts research.

Dr. Schretlen completed his doctorate in clinical psychology at the University of Arizona in 1986, an internship at McLean Hospital, Harvard Medical School, and a post-doctoral residency in neuropsychology and rehabilitation at the UCLA Neuropsychiatric Institute. While at UCLA, Dr. Schretlen was awarded a Mary E. Switzer fellowship by the National Institute of Disability and Rehabilitation Research.

Dr. Schretlen has served as a grant reviewer for the National Institutes of Health and the Veterans Administration Medical Center. He serves on the editorial boards of several scientific journals. A prolific researcher, he has authored over 175 articles, monographs, book chapters, and abstracts. His research interests include the use of quantitative brain imaging to investigate cognitive and emotional aspects of human behavior. He has received federal and private research funding to study determinants of work disability in traumatic brain injury and bipolar disorder. He currently is analyzing predictors of functional disability in schizophrenia and bipolar disorder. Related to this is another program of research in which Dr. Schretlen is investigating strategies to increase the diagnostic sensitivity and specificity of neurocognitive measures for persons of diverse socioeconomic background.

In addition to research and teaching, Dr. Schretlen is actively engaged in clinical work that primarily involves neuropsychological assessment. He consults to physicians about treatment planning and attorneys about matters involving such matters as vocational aptitude and work disability resulting from brain injuries.

Mary Barros-Bailey, Ph.D.

Mary Barros-Bailey, PhD, CRC, NCC is a bilingual rehabilitation counselor, vocational expert, and life care planner in Boise, Idaho. She is the immediate past Chair (2007-2008) of the Commission on Rehabilitation Counselor Certification (CRCC) and served as the Ethics Committee Chair from 2005-2007. Mary was one of the founding members of the Inter-organizational O*NET Task Force (IOTF) that in the early 2000s collaborated with the US Social Security Administration and the US Department of Labor on the use of occupational data within the disability context. She is a reviewer or on the Editorial Boards of several peer-review journals such as the Journal of Counseling & Development (American Counseling Association), the Journal of Forensic

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Vocational Analysis (American Board of Vocational Experts), and the Journal of Mixed Methods Research (SAGE Publications). Mary has a doctorate in Counseling with a cognate in Rehabilitation Counseling from the University of Idaho. Her research and presentation interests include professional issues in rehabilitation counseling (ethics, methodological, aging, multicultural, and international). She has presented and published nationally and internationally.

Robert T. Fraser, Ph.D.

Robert T. Fraser, Ph.D. is a professor in the University of Washington's Department of Rehabilitation Medicine, jointly with the Departments of Neurological Surgery and Neurology and consultant with Associates in Rehabilitation and Neuropsychology. He is an active counseling and rehabilitation psychologist, a certified rehabilitation counselor and a certified life care planner who directs Neurological Vocational Services within Rehabilitation Medicine. Within neurological rehabilitation, he has specialized in epilepsy, brain injury, and multiple sclerosis.

Dr. Fraser is author or co-author of more than one hundred publications and co-editor on four texts to include Traumatic Brain Injury Rehabilitation (CRC Press, 1999), Multiple Sclerosis Workbook (New Harbinger, 2006), and Comprehensive Care in Epilepsy (John Libbey, 2001). He has been awarded numerous Federal grants by the Department of Education (NIDRR and RSA) - four of which have been specific to traumatic brain injury rehabilitation, and, more recently, in epilepsy self-management by the Center for Disease Control (CDC). He was awarded two World Rehabilitation Fund fellowships to review, respectively, the post-acute traumatic brain injury programs in Israel and epilepsy rehabilitation advances in Scandinavia and Holland. He lectures nationally on TBI rehabilitation. Research emphases have included evaluation of innovative psychosocial rehabilitation strategies and prediction of vocational rehabilitation outcome across different neurological disabilities. He is the recipient of two American Rehabilitation Counseling Association Research Awards, and an Epilepsy Foundation of America Career Achievement Award. Dr. Fraser is a past-president of Rehabilitation Psychology, Div. 22 of the American Psychological Association and a Fellow in the Division, a former Board member of the Epilepsy Foundation of America (EFA), a current board member of the Epilepsy Foundation Northwest, and was recently elected to the Board of Governors for the International Consortium of Multiple Sclerosis Centers.

Dr. Fraser has received master's degrees in rehabilitation counseling (University of Southern California) and public administration (Seattle University). His doctorate is in rehabilitation psychology from the University of Wisconsin–Madison, with a dissertation focused on the use of task analysis in the national classification and utilization of state agency vocational rehabilitation personnel.

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Sylvia E. Karman

As Director for Social Security Administration's (SSA's) Occupational Information Development Project in the Office of Program Development and Research, Sylvia E. Karman oversees the research and development of occupational information tailored to SSA's disability programs. She directs the investigations and developmental work to replace the *Dictionary of Occupational Titles*, as well as studies to inform disability policy development. She also chairs the SSA Occupational Information System Development Workgroup.

Ms. Karman serves as an expert for SSA executive management and for numerous private and public sector entities on medical-vocational assessment and occupational information issues critical to disability evaluation. As the former Chief of the Vocational Policy Branch in SSA's Office of Disability Programs and, before that, the lead senior policy analyst and project manager for occupational information analysis and policy issues related to SSA's use of the Dictionary, she has long held a leadership role for the agency in these subject areas.

Ms. Karman began her career with SSA in 1979 as a college intern. After graduating in 1982 with a bachelors of arts degree from Towson University in Maryland, her work involved policy and legislative development and program evaluation for the Supplemental Security Income program under title XVI and for the agency's disability programs under both titles II and XVI. Ms. Karman has presented and published papers in the areas of SSA's use of the *Dictionary of Occupational Titles* for disability adjudication, medical-vocational assessment, and the role of vocational factors and occupational information in disability evaluation, including transferable skills analysis. She is a frequent speaker at conferences and seminars throughout the US and Canada.

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Appendix B

Biographic Sketches of Mental Cognitive Roundtable Participants

David J. Schretlen, PhD, ABPP

See Appendix A

Mary Barros-Bailey, PhD, CRC

See Appendix A

Robert T. Fraser, PhD

See Appendix A

Sylvia E. Karman, BA

See Appendix A

Shannon Gwaltney-Gibson, PhD

Education

B.A., Liberal Arts, magna cum laude, Armstrong Atlantic State University

M.S., Industrial and Organizational Psychology, Virginia Polytechnic Institute & State University

Ph.D., Industrial and Organizational Psychology, Virginia Polytechnic Institute & State University

Areas of Expertise

Professor Gibson's expertise is in issues related to human resources management & organizational behavior in organizations. Her research includes more than 35 published conference proceedings and 19 peer-reviewed journal articles on topics relevant to human resources and organizational development including job analysis, technology acceptance in organizations, and entrepreneurship. Her research can be seen in the Journal of Small Business Strategy, Business Education Forum, Small Business Institute Forum, and Management Research News, among others.

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Professional Activities

Professor Gibson is an Associate Professor of Management at East Carolina University, where she has been a member of the College of Business since 2003. She has extensive experience teaching issues related to occupational analysis; in addition to currently teaching graduate level Human Resources, she previously spent two years teaching Industrial and Organizational Psychology at ECU, as well as courses at Radford University and Texas A&M Corpus Christi. She was awarded the 2009 Robert L. Jones University Alumni Award for Outstanding Teaching and the 2009 Max Ray Joyner Award for Faculty Service Through Continuing Education. In addition to her university responsibilities, she currently acts as a consultant to State Farm Insurance on issues related to human resources management and leadership development. She is a member of The Academy of Management, the Society for the Advancement of Management, the Society for Industrial & Organizational Psychology, the Southeast Decision Sciences Institute, and the Southeast Institute for Operations Research and the Management Sciences.

Mark Wilson, PhD

Dr. Mark A. Wilson, Associate Professor of Psychology, NC State University, joined the faculty in 1992. He received a B.A. in Psychology from Wartburg College (1975), an M.A. in Experimental Psychology from the University of Missouri-Kansas City (1978), and a Ph.D. in Industrial/ Organizational Psychology from Ohio State University (1983).

While completing the Ph.D., he served as Project Coordinator, Technical Director, and Senior Research Associate for Organizational Research and Development Inc. on a comprehensive human-resource research project involving human-resource planning, job analysis, selection (managerial assessment centers), performance appraisal, and compensation for a market-leading insurance company. The experience drastically altered his view of the field and his research interests. It was while working on the project that he developed his interest in the integration of human-resource systems, comprehensive job analysis, his dedication to the scientist-practitioner model and the problems of practitioners, and his love for fieldwork.

He has always been interested in work measurement issues, models of human job performance in organizations, and research methods. He has consulted and conducted research extensively with numerous large organizations in both the private and public sectors. He has taught graduate and undergraduate management courses as an Assistant Professor at both Texas Tech University (1981-1985) and Iowa State University of Science and Technology (1985-1992). In 1999, he was made an honorary member of the United States Army Special Forces. In 2006, he was appointed editor of *Ergometrika* (The Journal of Work Measurement Research).

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Gary R. Bond, PhD

Education

B.S., Mathematics, Michigan State University

M.A., Psychology, University of Chicago

Ph.D., Psychology, University of Chicago

Areas of Expertise

Professor Bond is an expert in effective rehabilitation approaches for people with severe mental illness. His research has focused on two particular areas: assertive community treatment, which is a comprehensive, intensive case management approach for people with severe mental illness who also have other challenging problems, and supported employment, which is an individualized approach to helping people attain competitive employment. He has published 139 peer-reviewed journal articles, 32 book chapters, and has taken part in 20 international presentations.

Professional Activities

Professor Bond is the Chancellor's Professor of Psychology at Indiana University Purdue University, Indianapolis. He served as the Director of the Clinical Rehabilitation Psychology Program at IUPUI for 14 years and also served as the Director of the Illinois Psychiatric Rehabilitation Training Institute from 2002-2003. Professor Bond has twice held the Research Scientist Development Award from the National Institute of Mental Health (1989-1994, 1996-2001) and has received national awards from the American Psychological Association, the American Rehabilitation Counseling Association, the International Association of Psychosocial Rehabilitation Services, and the National Association of Case Management. He is currently involved as a co-investigator or consultant on five grants.

Susanne Bruyère, PhD

Education

B.A., Psychology and Special Education, D'Youville College

M.S. Ed., Rehabilitation Counseling, University of Southern California

M.A., Adult Education, Seattle University

M.P.A, Public Administration, Seattle University

Ph.D, Rehabilitation Counseling, University of Wisconsin, Madison

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Areas of Expertise

Professor Bruyère is an expert in the fields of disability, disability and rehabilitation, disability and law, and diversity and inclusion. She has focused on other relevant topics including: primary and secondary prevention of workplace disability, disability management, non-discrimination for persons with disabilities in employment, the Americans with Disabilities Act (ADA), and the interplay between the ADA, human resource practices, and labor relations. She has contributed to 13 publications and her work can be found in journals such as the Journal of Rehabilitation Psychology and American Rehabilitation.

Professional Activities

Professor Bruyère is the Associate Dean of Outreach and the Director of the Employment and Disability Institute at Cornell University in the School of Industrial and Labor Relations – Extension Division. A fellow in the American Psychological Association, she has served as the past President of the Division of Rehabilitation Psychology of the American Psychological Association and the National Council on Rehabilitation Education. She currently serves on the boards of the National Association of Rehabilitation Research and Training Centers and of CARF (the Rehabilitation Accreditation Commission). She is currently the Project Director and Principal Investigator of numerous research efforts. Three are funded by the U.S. Department of Education, National Institute on Disability and Rehabilitation Research (NIDRR). One of the projects she is currently working on is a four-year research and demonstration project in collaboration with the Society for Human Resource Management, the Washington Business Group on Health, and the Lewin Group to address ways to improve the employment practices covered under the Americans with Disabilities Act (ADA).

Lynda Payne, PhD

Education

A.A., Nursing, Middle Tennessee State University, Murfreesboro, TN

B.S., Psychology, Idaho State University, Pocatello, ID

M.S., Marriage & Family Therapy, University of Maryland, College Park, MD

Ph.D., Applied Developmental Psychology, University of Maryland, Baltimore County, MD

Personal Activities and Interests

Lynda Payne, PhD, is a Consulting Psychologist for the State of Maryland's Disability Determination Services. In addition to her role as a consulting psychologist, she works

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as a Psychometrician for the Kennedy Krieger Institute in Baltimore, Maryland. From 1995-2004, she was involved in a research study for the Department of the Environment / HUD in which she investigated the treatment of lead-exposed children through a multi-site, clinical trial of an oral chelating agent. From 2001-2005, she examined the target capacity for expansion for adolescent outpatient substance abuse treatment.

She has presented at the International Conference on Infant Studies and has been published in the American Journal of Mental Retardation and the Encyclopedia of Human Behavior.

E. Sally Rogers, ScD

Education

B.A., Temple University

M.A., Seton Hall University

ScD, Boston University

Personal Activities and Interests

Professor Rogers is an Associate Professor of Occupational Therapy at the Sargent College of Health and Rehabilitation Sciences, Boston University. She also serves as the Director of Research at the Center for Psychiatric Rehabilitations. Her interests include the evaluating the effectiveness and cost effectiveness of psychiatric rehabilitations, measuring outcomes, and assisting psychological rehabilitation programs to evaluate the effectiveness of their services. She has contributed to 24 publications and is currently the principle investigator on three grants, two of which are funded by the National Institute on Disability and Rehabilitation Research (NIDRR).

Pamela A. Warren, PhD

Education

B.A., Psychology, Southern Illinois University, Carbondale, Illinois

M.A., Behavior Analysis and Therapy, Southern Illinois University, Carbondale, Illinois

Ph.D., Psychology, Southern Illinois University, Carbondale, Illinois

Professional Activities

Dr. Warren is a faculty member in the Department of Counseling as well as the Department of Psychiatry at the University of Illinois, Urbana, Illinois. She has worked as a Clinical Psychologist for the Carle Clinic Association in Urbana, Illinois since 1991.

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She continues to be an advisor for the American College of Occupational and Environmental Medicine's (ACOEM) Practice Guidelines newsletter, and is a psychological disability evaluator for the Illinois State Universities Retirement System. She conducts independent psychological evaluations and complete file & peer reviews for several national insurance companies and employers, such as Blue Cross Blue Shield, Claim Care, CountryWide, CompCare, American Airlines, Behavioral Medical Interventions, and Army Corp of Engineers, and others. She is a psychological consultant to Health Care Services Corporation and served as a consultant to the Social Security Administration's Ticket To Work program. She has served on a number of expert panels, such as the expert panels for ACOEM's Chronic Pain Practice Guidelines and Psychiatric Guidelines revision as well as the Social Security Administration's Functional and Vocational Expertise Panel. She has been co-investigator on a number of studies, including research on the evaluation of psychological concerns that occur in women with breast cancer and the EUMASS (European Union of Medicine in Assurance and Social Security) study of the Psychosocial Aspects of Disability and Healthcare. She has served as a reviewer for the American Medical Association Guide to the Evaluation of Permanent Impairment, 6th edition as well as for PsyBar, Inc. She has served on a number of committees and boards, including the Disability Research Institute Advisory Board Reed Group Medical Disability Advisory (MDA) Board, the International Board of Directors for the International Association of Rehabilitation Professionals Case Management Division, the Disability Management Employers Coalition Conference Selection Committee, and the Health Services Council, American Psychological Association, Division 38 (Health Psychology). She has conducted over 300 professional seminars on psychological issues related to disability, identification of psychological issues in the workplace, evidence-based treatments of psychological concerns in the workplace, chronic pain, illness issues, and appropriate forensic psychological evaluation to public and professional groups. These presentations have been conducted both locally and nationally. In addition to these presentations, Dr. Warren has written five publications.

Professional Associations

Dr. Warren is a member of the American Psychological Association (Clinical, Health, Occupational Health, and Consulting Psychology Divisions), the American College of Occupational & Environmental Medicine, the Association for Applied Psychophysiology and Biofeedback, the Prescribing Psychologists Register, the International Association for Rehabilitation Professionals, the Disability Management Employers Coalition, and the Association for the Scientific Advancement of Psychological Injury and Law.

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Appendix C – 1

Mental Cognitive Roundtable – Instructions to Participants

General Meeting Information

The meeting will be held at the Hyatt Regency McCormick Place, 2233 South Martin L. King Drive, Chicago, Illinois, USA 60616-9985, in Conference Center Room CC22C on Monday, June 8, 2009, from 8:30 am to 4:30 pm (CDT).

For Roundtable participants, your travel arrangements will be handled by A-S-K Associates, as you were notified in an email from Debra Tidwell-Peters.

For Panel members, if you have any questions about travel, please contact Elaina Wise at 410-965-9863.

If you need directions or information from the hotel, please see the hotel website at <http://www.mccormickplace.hyatt.com/hyatt/hotels/index.jsp> or contact the hotel at (312) 567-1234.

Roundtable Discussion Materials and Assignments

The attached document, “Purpose and Scope of Roundtable,” will provide you with detailed information on the research questions that we are investigating, as well as background information on Social Security’s disability programs. The latter will provide the context for this discussion.

Before the Roundtable, we ask that you:

1. Read the “Purpose and Scope” document and any pertinent sections of the Appendices,
2. Complete the brief (two pages or less) writing assignment described in the “Purpose and Scope” document, bringing this with you to the Roundtable, and
3. Send a brief (one page or less) biography to Shirleen Roth, SSA staff, at shirleen.roth@ssa.gov.

After the Roundtable, we will ask you to send us your original writing assignment, described in bullet 2 above. In addition, we will ask you to revise your responses (or not) in light of the Roundtable discussion and send that to us as well. Your “pre” and “post” meeting responses will be used to document the outcome of the Roundtable.

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Appendix C – 2

SOCIAL SECURITY ADMINISTRATION

Occupational Information Development Advisory Panel

Mental Cognitive Subcommittee Roundtable

Agenda - Monday, June 8, 2009

8:30 am to 8:45 am	OPENING COMMENTS AND INTRODUCTIONS Sylvia E. Karman Project Director, Occupational Information System Project, Social Security Administration Panel Member, Occupational Information Development Advisory Panel
8:45 am to 9:00 am	OPENING COMMENTS David J. Schretlen, Ph.D. Panel Member, Occupational Information Development Advisory Panel Chair, Mental Cognitive Subcommittee
9:00 am to 10:00 am	DISCUSSION Discuss the existing categories of psychological and interpersonal functioning on SSA's Mental Residual Functional Capacity (MRFC) Assessment form.
10:00 am to 10:15 am	BREAK
10:15 am to 11:30 pm	DISCUSSION Discuss categories of psychological and interpersonal functioning which, if impaired by disease or injury, might impede an individual's ability to work.
11:30 am to 12:45 pm	LUNCH ON YOUR OWN

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12:45 pm to 1:45 pm	DISCUSSION (continued from morning session) Discuss categories of psychological and interpersonal functioning which, if impaired by disease or injury, might impede an individual's ability to work.
1:45 pm to 2:00 pm	BREAK
2:00 pm to 3:00 pm	DISCUSSION Discuss the empirical studies that identify the psychological or interpersonal deficits that decrease the likelihood that an affected individual would be able to do competitive work.
3:00 pm to 3:15 pm	BREAK
3:15 pm to 4:15 pm	DISCUSSION Discuss the best approach(es) for assessing the categories of psychological and interpersonal functioning described earlier in the day.
4:15 pm to 4:30 pm	REVIEW OF DISCUSSION AND ACTION ITEMS David J. Schretlen, Ph.D., Chair
4:30 pm	ADJOURN

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Appendix C – 3

Mental Cognitive Roundtable – Purpose and Scope of the Roundtable

Occupational Information Development Advisory Panel

Mental/Cognitive Subcommittee

On June 8, 2009, the Mental/Cognitive Subcommittee (the Subcommittee) of the Occupational Information Development Advisory Panel (the Panel) will be conducting a Roundtable to obtain the opinions and facilitate a discussion by experts in the field of mental and cognitive functional limitations resulting from impairments. The information gathered at this Roundtable will assist the Subcommittee in making recommendations to the Panel on the mental, cognitive, and psychosocial requirements of work.

The task of this subcommittee is to identify the most important dimensions of psychological and interpersonal functioning that are impaired by diseases or medical conditions and, as a result, disable a person from working. The task is not to identify diseases or injuries that cause the functional deficits, nor is it to determine how best to assess or remediate the deficits. Rather, the task is to develop a parsimonious list of essential psychological and interpersonal capacities that, when disrupted by illness or injury, prevent affected individuals from engaging in substantial gainful activity (i.e., competitive work).

We ask each participant to write a brief response to each of the following questions, after considering SSA's current [Mental Residual Functional Capacity \(MRFC\) Assessment](#), and be prepared to discuss your views of each at the Roundtable. Please try to limit your response to these questions to two pages or less (total).

5. If you think the current MRFC Assessment does not need revision, or that improving it is not feasible, explain why.
6. If you think the existing MRFC Assessment could be improved, then nominate up to 10 dimensions of psychological and interpersonal functioning that, when impaired by disease or injury, impede one's ability to work.²
7. Do you know of any well-designed empirical studies that have identified psychological or interpersonal deficits that decrease the likelihood an affected individual will be able to do competitive work?
8. While the goal of this Roundtable is not to devise measures of the person characteristics you nominate in response to Question 2, please comment on

² For purposes of calibrating the level of specificity that we are looking for, a capacity such as "the ability to reason" is too global and nonspecific. Conversely, a capacity such as "the ability to tolerate occasional brusque remarks from co-workers without losing one's temper" might be too specific. Because our aim is to develop a list of candidate abilities that is comprehensive but parsimonious, we ask that you limit your list to about 10 functional capacities. Based on SSA requirements, these dimensions or factors must be observable and measurable.

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what you deem to be the best approach (informant-rating, self-rating, direct observation, testing) to assess the characteristics you enumerated. (These might vary across functions.)

We have attached background materials to assist participants in preparing for the Roundtable and in becoming familiar with the legal framework within which the Social Security Administration (SSA) adjudicates disability claims. We do not intend that participants will become experts on SSA's disability programs or policy but, rather, that participants will understand the context in which we ask these questions and the necessary limitations to the scope of the Roundtable discussion. To some extent, this scope will also be described in this paper.

While we have provided policy statements as context for the discussion, the discussion will focus on the four research questions cited above, not SSA policy.

The Social Security Act (the Act) and the Definition of Disability

The Act defines disability as an inability to do substantial gainful work because of a “medically determinable physical or mental impairment.” A physical or mental impairment (impairment) is “an impairment that results from anatomical, physiological, or psychological abnormalities which are demonstrable by medically acceptable clinical and laboratory diagnostic techniques.” The Act stipulates that “an individual shall not be considered to be disabled ... if alcoholism or drug addiction would ... be a contributing factor material to the ... determination that the individual is disabled.” (See *Appendix A*.)

Appendix A is provided as a reference and is not required reading.

Use of the Dictionary of Occupational Titles in SSA's Disability Programs

The background paper by this title, located in *Appendix B*, provides an overview of the history of SSA's disability programs and SSA's occupational information needs. It explains, in particular, the three criteria that any occupational reference used by SSA (or created by SSA) must meet (*pages 3 – 4*). We ask that all participants read this background paper.

Listed Impairments

Some impairments are so severe that, based on medical considerations only, SSA will determine that an individual with one of these listed impairments is unable to work and therefore disabled, without comparing his or her functioning to the requirements of the world of work. To adjudicate these claims, SSA does not need occupational

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information. For your information, we have included, in *Appendix C*, a copy of the listed impairments for mental disorders.

Appendix C is provided as a reference and is not required reading. However, we believe that it would be helpful for all participants to have an understanding of the level of severity reflected in these listed impairments. In the Roundtable discussion, you do not need to consider requirements of work that reflect mental impairments so severe that an individual with that impairment would be considered disabled without considering the world of work.

Residual Functional Capacity

Because of the definition of disability contained in the Act and similar language in the Regulations, SSA considers only the physically or mentally limiting effects of an impairment(s) when assessing the functional capacity that the individual retains. That is, SSA does not consider, for example, the individual's age, body habitus, level of conditioning or deconditioning, personality, aptitudes, basic talents and abilities, and so on, when it assesses an individual's functional capacity. It considers only the limiting effects of the impairment(s). (See 20 CFR 404.1545 in *Appendix D*.)

For your reference, we have attached the form that SSA uses to document its assessment of a claimant's "mental residual functional capacity" (*the last Appendix*) and SSA instructions to adjudicators on how to complete this form (*Appendix E*). As you will see, SSA currently identifies four categories, or domains, of functioning:

- Understanding and Memory,
- Sustained Concentration and Persistence,
- Social Interaction, and
- Adaptation.

Other potential categories of functioning that might be considered include, for example, Applying Information, Interacting with Others, Maintaining Pace, and Managing Oneself.

These categories of functioning are the focus of this Roundtable. As such, we ask that all participants read 20 CFR 404.1545 ("Residual Functional Capacity" only) in *Appendix D* and the form, "Mental Residual Functional Capacity Assessment" (SSA-4734-SUP), in the *last Appendix*. *Appendix E* is intended to answer any questions you may have about completion of the form, "Mental Residual Functional Assessment," for example, questions about the definition of the term "moderately limited," so that these questions do not distract from the Roundtable discussion. Reading of *Appendix E* is not otherwise required.

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Evaluation of the Claimant's Ability to do Past Work or Other Work

When comparing an individual's functional capacity with the jobs that exist in the national economy and the demands of those jobs, SSA currently uses the Dictionary of Occupational Titles as a primary reference of how work is performed in the national economy. In making this comparison, SSA does not consider whether work exists in the immediate area in which the claimant lives, whether a specific job vacancy exists for him or her, or whether the claimant would be hired if he or she applied for work. (See 20 CFR 404.1566(a) in *Appendix D*). In addition, if an individual is able to do work, given his or her functional capacity and vocational profile, SSA does not consider if he or she remains unemployed because of:

- His or her inability to get work;
- Lack of work in his or her local area;
- The hiring practices of employers;
- Technological changes in the industry in which he or she has worked;
- Cyclical economic conditions;
- No job openings for him or her;
- The claimant would not actually be hired to do work he or she could otherwise do; or
- The claimant does not wish to do a particular type of work.

(See 20 CFR 404.1566(c) in *Appendix D*.)

Lastly, the Act and Regulations proscribe consideration of any element other than that mentioned in the citations. As a result, in determining disability, SSA does not consider elements that vocational rehabilitation specialists might consider in developing an intervention for a client. For example, SSA does not consider placement and employability issues, the potential for supported employment, accommodations (other than those actually provided by a previous employer), and increased vocational potential through training.

For "Residual Functional Capacity," we asked that you read 20 CFR 404.1545 ("Residual Functional Capacity" only) in *Appendix D*. The remaining sections of *Appendix D* are provided as a reference and are not required reading.

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Appendix C – 4

**EXCERPT FROM THE SOCIAL SECURITY ACT, AS AMENDED,
AND RELATED ENACTMENTS THROUGH JANUARY 1, 2009**

Disability Insurance Benefits

Sec. 223. [42 U.S.C. 423]

Definition of Disability

(d)(1) The term “disability” means ... inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or which has lasted or can be expected to last for a continuous period of not less than 12 months ...

(2) ... (A) An individual shall be determined to be under a disability only if his physical or mental impairment or impairments are of such severity that he is not only unable to do his previous work but cannot, considering his age, education, and work experience, engage in any other kind of substantial gainful work which exists in the national economy, regardless of whether such work exists in the immediate area in which he lives, or whether a specific job vacancy exists for him, or whether he would be hired if he applied for work. For purposes of the preceding sentence (with respect to any individual), “work which exists in the national economy” means work which exists in significant numbers either in the region where such individual lives or in several regions of the country.

(B) ***

(C) An individual shall not be considered to be disabled for purposes of this title if alcoholism or drug addiction would (but for this subparagraph) be a contributing factor material to the Commissioner's determination that the individual is disabled.

(3) For purposes of this subsection, a “physical or mental impairment” is an impairment that results from anatomical, physiological, or psychological abnormalities which are demonstrable by medically acceptable clinical and laboratory diagnostic techniques.

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Appendix C – 5

Mental Cognitive Roundtable – Background Paper:

Use of the Dictionary of Occupational Titles in SSA’s Disability Program

Background

How SSA Came to Consider Vocational Factors to Evaluate Disability

When Social Security was established in 1935, the Social Security Board discussed the prospects of creating a national program designed to protect workers in the event of disability. Even early discussions among Social Security Board members in the mid-1930s acknowledged that an assessment of disability would require the consideration of vocational aspects in addition to medical factors.³ Still, when the Social Security Administration’s (SSA’s) disability insurance program for cash benefits was enacted in 1956, the law did not specifically require consideration of the factors of age, education, and work experience. The Social Security Act defined disability as the “inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or be of long-continued and indefinite duration”.⁴

However, it soon became apparent that disability could not always be decided on medical facts alone. In 1957, Arthur E. Hess, Assistant Director for the Division of Disability Operations, met with staff to give them guidance about borderline cases, that is, those cases that could not be decided on medical facts alone. He told them that they need to view the whole person, medically and vocationally.⁵ At that time, SSA used vocational factors to rebut or overcome the presumption that the individual is not disabled. By the late 1950s and early 1960s, SSA encountered numerous judicial and Congressional challenges involving cases in which SSA was unable to make a disability decision on medical facts alone and had denied disability on the basis that an individual was able to work despite his impairment.⁶ Congress investigated the new disability

³ Hess, Arthur E. (1993). *The Disability Program: Its Origin, Our Heritage, Its Future, Our Challenge*. Presented at the Social Security Administration Disability Symposium in Atlanta, GA on January 21. Baltimore: Social Security Administration.

⁴ Social Security Advisory Board (October 2003). *The Social Security Definition of Disability*, p. 3.

⁵ Hess, A.E. (1957) Staff paper: *Adjudicative Climate in Evaluation of Borderline Cases*. Presented at Bureau of Old-Age and Survivors Insurance, Division of Disability Operations staff meeting on March 29.

⁶ See, for example, *Kerner v. Fleming* (2nd Circuit, 1960) and *Rinaldi v. Ribicoff* (2nd Circuit, 1962).

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insurance program and its medical-vocational decision process in 1959.⁷ A number of the court cases in the early 1960s cases also focused attention on SSA's medical-vocational decisions. These cases involved a concept regarding "substantial evidence," in that once the claimant had proven that he was unable to do his previous work because of his impairment and that he did not have the skills and functioning to do other work, the burden of proof fell to SSA to show that he was "actually—not theoretically—capable of doing some type of work."⁸ SSA addressed these challenges through statutory changes and routine consultation of government occupational resources. SSA introduced a legislative proposal to include, among other changes, the consideration of vocational factors. Congress incorporated SSA's proposal and passed the 1967 Amendments which added the consideration of vocational factors to SSA's definition of disability. Since 1967, SSA and others interpret the definition of disability in section 223(d) of the Social Security Act to require SSA to look to the world of work to determine if an adult's impairment(s) is disabling when the individual's claim cannot be decided by medical facts alone. The following language was added to the law in 1967 and remains in effect today:

"An individual shall be determined to be under a disability only if his physical or mental impairment or impairments are of such severity that he is not only unable to do his previous work but cannot, considering his age, education, and work experience, engage in any other kind of substantial gainful activity which exists in the national economy, regardless of whether such work exists in the immediate area in which he lives, or whether he would be hired if he applied for work. For purposes of the preceding sentence (with respect to any individual), 'work which exists in the national economy' means work which exists in significant numbers either in the region where such individual lives or in several regions of the country."⁹

Consequently, SSA has referred to government labor market and occupational data since the court challenges of the early 1960s. SSA needed the data to arrive at and support its decisions regarding whether an individual's impairment is of such severity that it prevents him/her from doing not only his or her past work, but any other work in the U.S. economy.

⁷ See Harrison Subcommittee Report, *Preliminary Report to the Committee on Ways and Means* (U.S. House of Representatives, 1960).

⁸ U.S. House of Representatives, Committee on Ways and Means (1974), Subcommittee Staff Report on the Disability Insurance Program. Washington, D.C.: U.S. Government Printing Office, p. 46.

⁹ See Social Security Act, Section 223(d)(2)(A)

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What is the Dictionary of Occupational Titles?

Over the years, SSA has come to rely on the Department of Labor's (DOL's) Dictionary of Occupational Titles (DOT) as its main occupational resource to evaluate disability claims when the decision cannot be made based on medical facts alone. The DOT is an occupational classification system of jobs in the U.S. economy. The DOL first developed the classification in 1939, and it produced several updates throughout the decades. Following its last major revision in 1977, and minor revisions in 1991, the DOT contains over 12,000 occupations. Arranged by industry, the DOT occupation descriptions reflect the main tasks, strength level requirements, and skill level of the occupation. In the 1970s, SSA contracted with DOL to produce a companion volume to the DOT entitled the Selected Characteristics of Occupations (SCO) that provides measures for additional physical demands of work for DOT occupations, such as climbing, balancing, reaching, handling, special senses requirements (visual acuity, hearing, etc.), and environmental requirements (noise levels, exposure to cold, etc.). The DOL last updated the SCO in 1993.

The DOT and SCO provide measurable ratings for physical demands of work for each of the 12,000+ occupations. These ratings have been crucial to SSA's evaluation of how much an individual can do despite his impairment (residual functional capacity or RFC) and whether this level of functioning enables the individual to do his past work or any other work.

What Compels SSA to Use the Dictionary of Occupational Titles?

Any occupational resource that SSA uses must meet at least three criteria. To date, the DOT is the only occupational resource produced publicly or privately that accomplishes this. The three criteria are as follows:

1. Must Reflect Work Requirements

The need for an occupational resource to enable SSA to compare human function with work requirements is by far the largest hurdle SSA must overcome regarding its reliance on the DOT. This criterion involves the need to **assess an individual's RFC in terms of the ability to work**. The need for demands of work that can be walked back to an individual's medical evidence to assess functioning is crucial because work is the yardstick used in the statutory definition of disability. Despite active research on the

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subject,¹⁰ SSA has not been successful in finding an effective alternative that is also operationally feasible to an RFC assessment and comparison with job demands. The Social Security Act states...

That **disability is defined as the “inability to engage in substantial gainful activity by reason of a medically determinable physical or mental impairment...”** (Section 223(d)(1)(A)).

That SSA shall find **an individual to be disabled only if his/her impairment(s) is so severe that he/she “is not only unable to do...previous work, but cannot considering age, education, and work experience, engage in any other substantial gainful activity”** (Section 223(d)(2)(A)).

It does not matter “whether such work exists in the immediate area in which [the claimant] lives, **whether a specific job vacancy exists...or whether [the claimant] would be hired if [he/she] applied for work”** (Section 223(d)(2)(A)).

Therefore, an occupational resource must enable SSA to evaluate the claimant’s ability to *perform* work (residual functional capacity) rather than to *obtain* work (employability). As such, the resource must reflect information that is aggregated, described, and rated in a manner that enables SSA adjudicators to compare an individual’s RFC to work requirements to determine the individual’s ability to perform work despite a severe impairment(s).

So far, the DOT is the only resource of occupations existing nationwide that provides the measures needed to assess function in terms of ability to work.¹¹

2. Must Reflect National Existence and Incidence of Work

The Act states...

That SSA must consider the claimant’s age, education, and **work experience** to determine if he/she can “engage in **any other substantial gainful activity**” that “**exists in the national economy.**”(Section 223(d)(2)(A)).

¹⁰ Institute of Medicine (1999). *Measuring Functional Capacity and Work Requirements: Summary of a Workshop*;

American Institutes for Research (1999). *Synthesis, Integration, and Completion of Research into a New Disability Decision Making Process and Development of Initial Prototype of that Process*; Disability Research Institute (2002). *Job Demands Project*.

¹¹ While at least one private sector update of DOT data exists, it only updates DOT data and does not represent a new or different classification system.

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That “**work which exists in the national economy’ means work which exists in significant numbers** either in the region where the individual lives or in several other regions of the country.” (Section 223(d)(2)(A)).

Therefore, any occupational resource that SSA uses must reflect work that actually exists in “significant numbers” throughout the nation (or throughout at least several regions of the nation). To meet this requirement of the law, SSA regulations take administrative notice of the reliable job information from various government sources, including the DOT.¹² More information about SSA vocational rules is discussed below.

3. Must Meet the Burden of Proof in a Legally Defensible Way

Section 223(d)(2)(A) was added to the Social Security Act in 1967 to address judicial¹³ and legislative¹⁴ concerns regarding SSA’s burden of proof and consistency in making disability determinations or decisions in cases for which both medical and non-medical factors must be considered. This section of the Act has long been construed to mean that SSA has a burden of proof regarding its determination or decision that a claimant has the ability to work despite a severe medical impairment. SSA must show “what the claimant can do”¹⁵ and that the claimant is “actually—not theoretically—capable of doing some kind of work.”¹⁶

Therefore, any alternative occupational resource SSA uses must be legally defensible for SSA to meet its burden of proof.¹⁷ This means that the alternative resource should be validated by an objective third party for use in SSA’s disability process. While the DOT is imperfect, SSA’s use of it has been upheld in the Supreme Court.¹⁸ It has face validity that has been tested judicially.

¹² 20 CFR 404.1566(d) and 416.966(d)

¹³ See *Kerner v. Fleming* (2nd Circuit, 1960) and *Rinaldi v. Ribicoff* (2nd Circuit, 1962).

¹⁴ See Harrison Subcommittee Report, *Preliminary Report to the Committee on Ways and Means* (U.S. House of Representatives, 1960), pp. 17-20.

¹⁵ SSA’s need to show “what the claimant can do” is one of the main points of the Kerner Doctrine that formed the basis for SSA’s vocational policy in the early 1960’s and led to the 1967 Amendments’ addition of vocational factors to the Statute. See *Kerner v. Fleming* (2nd Circuit, 1960).

¹⁶ Committee on the Ways and Means, *Staff Report on the Disability Insurance Program* (U.S. House of Representatives, 1974), p. 45.

¹⁷ Courts require expert testimony (and the data and methods used) to meet specific standards. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), and *Kuomo Tire Co. v. Carmichael*, ___ U.S. ___, No. 97-1709, Slip op. at 11, 67 USLW 4179, 4183 (March 23, 1999).

¹⁸ See *Taylor v. Schweiker* (SSR 82-47c) and *Campbell vs. Heckler* (SSR 83-46c).

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Use of the Dictionary of Occupational Titles for SSA Disability Evaluation

As outlined above, the Social Security Act defines disability as follows:

“inability to engage in any substantial gainful activity by reason of a medically determinable physical or mental impairment which can be expected to result in death or which has lasted or can be expected to last for a continuous period of not less than 12 months.[a]n individual shall be determined to be under a disability only if his physical or mental impairment or impairments are of such severity that he is not only unable to do his previous work but cannot, considering his age, education, and work experience, engage in any other kind of substantial gainful activity which exists in the national economy¹⁹

An important point is that SSA’s definition of disability embodies a medical-vocational concept. It requires a medical cause (i.e., a “medically determinable physical or mental impairment”) and a directly related vocational consequence (i.e., the “inability to engage in any substantial gainful activity”). So, SSA’s disability evaluation process relies, fundamentally, on a comparison between what a person can do and what jobs require.

Sequential Evaluation Process

To decide whether an individual is disabled under this definition, SSA has established an evaluation process that all adjudicators at all levels must follow.²⁰ We consider the following questions, sequentially, and stop as soon we reach a decision:

- Step 1: Is the individual currently working and performing “substantial gainful activity” (SGA)? If yes, the person is not disabled. Otherwise, go to step 2.
- Step 2: Does the individual have an impairment that is severe and meets duration requirements? If no, the person is not disabled. Otherwise, go to step 3.
- Step 3: Does the individual’s impairment(s) meet (or equal) the criteria in the Listing of Impairments? If yes, the person is disabled. Otherwise, go to step 4.

¹⁹ §223(d)(1)(A) and 223(d)(2)(A) of the Social Security Act. The Statute provides a different definition of disability for children under the age of 18 applying for benefits under Title XVI.

²⁰ See 20 CFR 404.1520 and 416.920. If an individual already qualifies for benefits and SSA must determine whether his/her disability continues, SSA uses a different sequential evaluation process that includes a medical improvement review standard. See §§404.1594 and 416.994 of our regulations.

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- Step 4: Is the individual still able to perform past work? If yes, the person is not disabled. Otherwise, go to step 5.
- Step 5: Is the individual able to do other work, given his/her residual functional capacity, age, education, and work experience? If yes, the person is not disabled. If no, he/she is disabled.

The First Three Steps

While the first three steps of the five-step sequential evaluation process do not require adjudicators to consult an occupational reference, each of the three steps has a connection to the world of work. At step 1, we determine whether the individual is working (doing “substantial gainful activity”). At step 2, we consider the medical severity and duration of the individual’s impairment(s). Regarding severity, we determine whether the impairment(s) prevents the individual from doing basic work activities. SSA regulations define these activities as “abilities and aptitudes necessary to do most jobs,” and the regulations provide examples:

Physical functions such as walking, standing, sitting, lifting, carrying, reaching, handling, etc.

Capacities for seeing, hearing, and speaking.

Understanding, carrying out, and remembering simple instructions.

Use of judgment.

Responding appropriately to supervision, co-workers, etc.

Dealing with changes in a routine work setting.²¹

At step 3, we consider whether the individual’s impairment(s) meets or equals the criteria cited in the Listing of Impairments.²² SSA does not consider the vocational factors of age, education, and work experience at this step. The Listing of Impairments describes impairments that SSA considers to be severe enough to prevent an individual from doing any gainful activity, a stricter standard than “substantial gainful activity” that is applied at steps 1, 4 and 5.

²¹ See §§ 404.1520 and 416.920.

²² See §§ 404.1520 (d) and 416.920(d). For the purpose of the Listing of Impairments, see §§ 404.1525(a) and 416.925(a). Listing of Impairments can be found in Appendix 1, Part 404, Subpart P.

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Assessment of Residual Functional Capacity

If we cannot determine at step 3 whether an individual is disabled, we must proceed to step 4. But before we go to step 4, we must assess the individual's RFC. The RFC is the most an individual can do despite the limitations of his or her impairment(s). We assess RFC based on all relevant medical and other evidence that is in the individual's case record.

Assessment of human function is one side of the disability evaluation equation, and the assessment of what is required to do work forms the other side of the equation. The DOT and the SCO classify what is physically required, including ratings and measures, for over 12,000 occupations nationwide. To be able to make use of the DOT's descriptions of work as proxies for the ability to function, SSA's RFC assessment process is based on DOT/SCO definitions, ratings, and measures. As such, the form SSA uses to assess physical RFC (SSA-4734-BK) describes a person's ability to do work-related physical activity **in terms of the rating categories cited in the DOT and SCO**, e.g., physical demands related to strength (walking, standing, lifting, carrying, etc.) or other physical functions, including postural and manipulative functions (stooping, crouching, reaching, handling, etc.).²³

Connections between the DOT definitions, ratings, and measures of physical demands of work and SSA's RFC are evident in how SSA assesses physical function, such as strength. For example, the DOT classifies work into five strength levels, with "sedentary" being the lowest and "very heavy" being the highest. SSA's physical RFC enables SSA adjudicators and medical consultants to rate the most the individual can do in terms of strength (e.g., lifting, carrying, standing, walking) and other physical functions so that the individual's RFC can be compared to his or her past work or other work as defined in the DOT. Figure 1 on the next page displays an example of case information and how the RFC and DOT definitions mesh to enable an adjudicator to evaluate the individual's RFC, and ability to do past or other work.

²³ See §§ 404.1545 and 416.945. For individuals with mental disorders, we also rate their ability to meet other job demands that are not captured in the DOT, such as the ability to understand, remember and carry out instructions, and the ability to respond appropriately to supervision, co-workers, and work pressures in a work setting. See §§ 404.1545(c) and 416.945(c).

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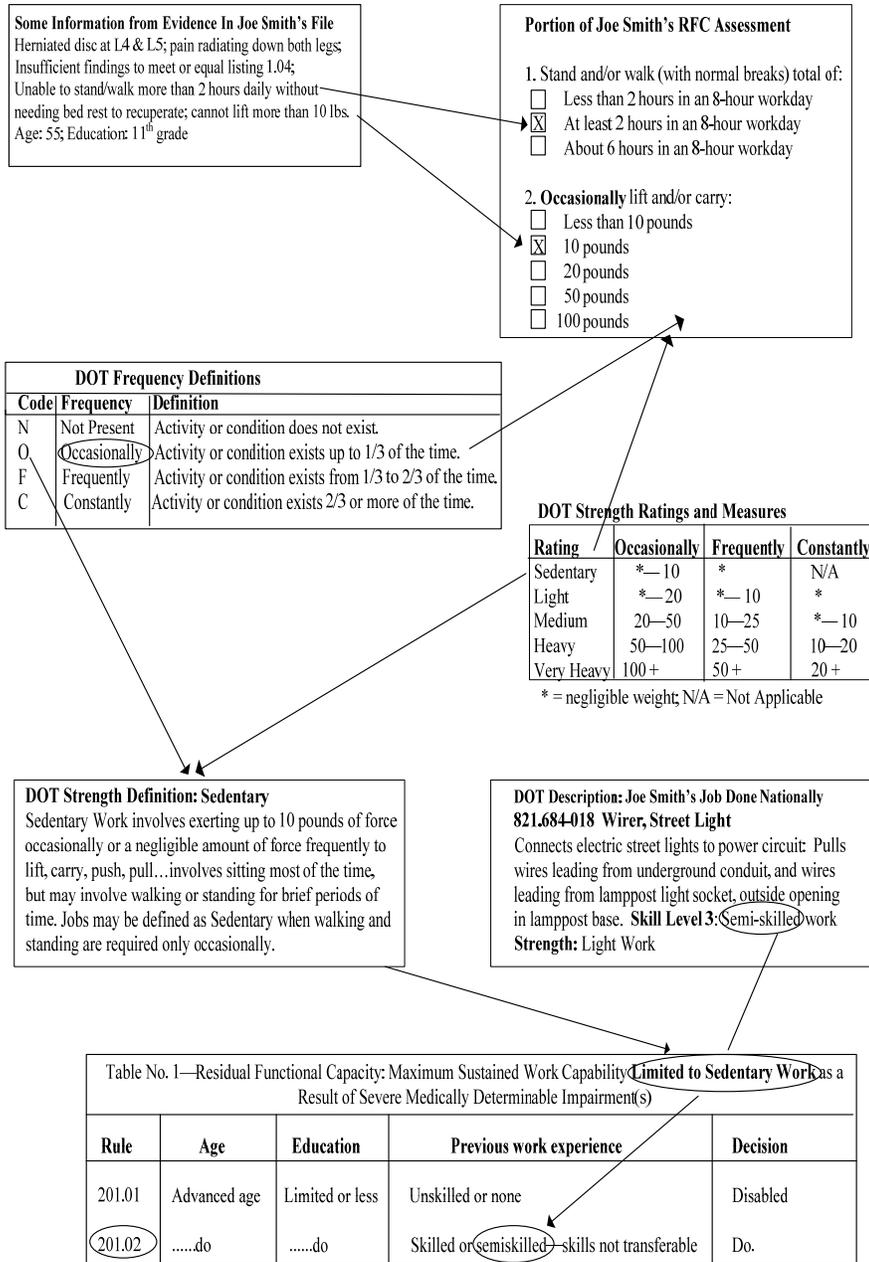


Figure 1: Illustration of How DOT Definitions are Reflected in Evaluation of RFC and Steps 4 and 5.

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Figure 1 shows how evidence from the individual's (Joe Smith's) case record is used to evaluate his RFC. Also, Figure 1 illustrates that the RFC questions are based on definitions, measures, and ratings from the DOT. Figure 1 indicates that Joe Smith has an RFC that limits him to work involving the lowest strength level, sedentary work. That means that Joe cannot do his past work as a Street Light Wirer, either as he did it or as it is done in the economy generally, because the limitations of his back impairment prevent him from doing key tasks. Also, we see that the job requires a higher strength level (light) than his RFC permits. Furthermore, given his age (55), education (11th grade), work experience (semi-skilled and cannot be transferred to other work), and RFC (sedentary), we would find he is disabled as directed by rule 201.02. Figure 1 features a portion of Table 1 of the Grid, which includes rules for cases in which the individual is limited to sedentary work, and the relevant rule and vocational factors are circled.

Step 4

At step 4, we compare the individual's RFC to the demands of his or her past work. If the individual cannot do his/her past work as the individual describes it, then we must determine if he or she has the RFC to do his or her past work as it is done generally in the economy. When we do this, we often rely on the DOT/SCO for information about the job demands that are relevant to the individual's RFC.

Step 5

If the individual cannot do his/her past work, we move on to step 5. At this point, we use the same RFC assessment to decide whether there are other jobs the individual can do, considering his/her age, education and work experience. To make this judgment, we use the DOT and SCO for information about other jobs that may be within the person's abilities and to help assess the potential vocational advantages/disadvantages of the person's education and work experience (i.e., acquired skills). We use the DOT to cite jobs in certain situations when we determine that an individual can do other work. SSA's regulations also permit the use of vocational experts or other specialists,²⁴ and these experts frequently rely on occupational resources that are also tied to the DOT.

Using the Grid at Step 5

SSA's regulations take administrative notice of "reliable job information available from various governmental and other publications," including the DOT.²⁵ At step 5, SSA

²⁴ See 20 CFR 404.1566(e) and 416.966(e)

²⁵ See 20 CFR 404.1566(d) and 416.966(d)

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adjudicators must consult a set of tables in Appendix 2 of Part 404, Subpart P, known as the vocational rules or the Grid, to arrive at a decision. The Grid combines certain medical-vocational fact patterns into “rules” that direct a decisional outcome (i.e., either “disabled” or “not disabled”). The four basic factors that are combined in the Grid involve strength level (based on RFC assessment and DOT ratings), age, education, and work experience (no work, unskilled, semi-skilled, or skilled). The existence of jobs in the national economy is reflected in the “Decisions” shown in the vocational rules.²⁶

Below are excerpts of the Grid displaying a few rules in each of the tables. Note that each table reflects a distinct strength level: sedentary, light, medium:

Table No. 1—Residual Functional Capacity: Maximum Sustained Work Capability Limited to Sedentary Work as a Result of Severe Medically Determinable Impairment(s)

Rule	Age	Education	Previous work experience	Decision
201.01	Advanced age	Limited or less	Unskilled or none	Disabled
201.02	.....do	.....do	Skilled or semiskilled—skills not transferable	Do.

*Table 1 contains 29 rules: 201.01-201.29

Table No. 2—Residual Functional Capacity: Maximum Sustained Work Capability Limited to Light Work as a Result of Severe Medically Determinable Impairment(s)

Rule	Age	Education	Previous work experience	Decision
202.01	Advanced age	Limited or less	Unskilled or none	Disabled.
202.05	.....do	High school graduate or more—provides for direct entry into skilled work ^[2]	.....do	Not disabled.

*Table 2 contains 22 rules: 202.01 through 202.22.

²⁶ See Part 404, Subpart P, Appendix 2, Section 200.00(b).

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Table No. 3—Residual Functional Capacity: Maximum Sustained Work Capability Limited to Medium Work as a Result of Severe Medically Determinable Impairment(s)

Rule	Age	Education	Previous work experience	Decision
203.01	Closely approaching retirement age	Marginal or none	Unskilled or none	Disabled.
203.03	.....do	Limited	Unskilled	Not disabled.
203.05	.....do	.....do	Skilled or semiskilled—skills transferable	Do.

*Table 3 contains 31 rules: 203.01 through 203.31

Section 204.00 of Appendix 2, Part 404, Subpart P, represents work that is heavy or very heavy. There is no table for section 204.00, and it is most often used when the individual has a severe impairment(s) that affects mental or cognitive functions or other non-strength physical functions, but there are no strength limitations. Therefore, adjudicators use this rule when evaluating an impairment that does not preclude heavy work (or very heavy work), considering also age, education, and skill level of prior work experience.

All disability decisions made at step 5 are based on the Grid. If the facts of the case coincide directly with a Grid rule, we use the rule to direct the decision. However, if the facts of the case do not coincide exactly with the factors of a particular rule, we use the rule as guidance for decision-making, that is, we use the rule as a “framework.” For example, if the individual has both strength and non-strength limitations, the adjudicator must select the Grid rule that comes closest to facts of the case and use this rule as a framework. This is because the Grid reflects strength-related ratings, and it does not reflect non-strength physical limitations or mental/cognitive limitations. SSA regulations and rulings provide adjudicators guidance on how to assess limitations that are not reflected in the Grid to arrive at “framework” decisions.²⁷

The Grid matters for two main reasons:

- It takes “administrative notice” of the total number of unskilled jobs in the nation at three physical strength levels as classified in the DOT. This enables SSA to

²⁷ See §§ 404.1545(b) and (c), as well as 416.945(b) and (c). See also Part 404, Subpart P, Appendix 2, §§ 200.00(a)-(e). See also SSR 83-12, SSR 83-14, SSR 85-15, SSR 96-4p, SSR 96-8p, and SSR 96-9p.

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meet its burden of proof at step 5 when an adjudicator finds that an individual is capable of doing other work, considering the individual's RFC, age, education, and work experience (skill level).

- It provides consistent “rulemaking” or application of case fact patterns regarding RFC and vocational factors to ensure that SSA’s decisions are uniform, not arbitrary and capricious.²⁸

In summary, the five steps of sequential evaluation described above are derived from the definition of disability in the Social Security Act. This brief overview describes the importance of occupational information to SSA’s disability programs. For more than 50 years, SSA has been considering occupational information in disability determinations after reaching the conclusion that disability eligibility could not always be decided on medical factors alone. Over the years, SSA has come to rely on the Department of Labor’s DOT as the main source of this occupational information. Although the DOT was not designed specifically for SSA’s disability programs, it comes closer to meeting SSA’s legal and programmatic requirements than any other existing occupational information resource. Any occupational information system designed for SSA’s disability programs would need to replace the DOT, and meet three requirements: 1) It must reflect the requirements of work, 2) It must reflect the national existence and incidence of work, and 3) It must meet SSA’s “Burden of Proof” in a legally defensible way.

²⁸ See SSR 83-46c, *Heckler v. Campbell*.

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Appendix C – 6

Mental Cognitive Roundtable – Listed Impairments for Mental Disorders

Disability Evaluation under Social Security

(Blue Book- September 2008)

12.00 Mental Disorders

A. Introduction: The evaluation of disability on the basis of mental disorders requires documentation of a medically determinable impairment(s), consideration of the degree of limitation such impairment(s) may impose on the individual's ability to work, and consideration of whether these limitations have lasted or are expected to last for a continuous period of at least 12 months. The listings for mental disorders are arranged in nine diagnostic categories: Organic mental disorders (12.02); schizophrenic, paranoid and other psychotic disorders (12.03); affective disorders (12.04); mental retardation (12.05); anxiety-related disorders (12.06); somatoform disorders (12.07); personality disorders (12.08); substance addiction disorders (12.09); and autistic disorder and other pervasive developmental disorders (12.10). Each listing, except 12.05 and 12.09, consists of a statement describing the disorder(s) addressed by the listing, paragraph A criteria (a set of medical findings), and paragraph B criteria (a set of impairment-related functional limitations). There are additional functional criteria (paragraph C criteria) in 12.02, 12.03, 12.04, and 12.06, discussed herein. We will assess the paragraph B criteria before we apply the paragraph C criteria. We will assess the paragraph C criteria only if we find that the paragraph B criteria are not satisfied. We will find that you have a listed impairment if the diagnostic description in the introductory paragraph and the criteria of both paragraphs A and B (or A and C, when appropriate) of the listed impairment are satisfied.

The criteria in paragraph A substantiate medically the presence of a particular mental disorder. Specific symptoms, signs, and laboratory findings in the paragraph A criteria of any of the listings in this section cannot be considered in isolation from the description of the mental disorder contained at the beginning of each listing category. Impairments should be analyzed or reviewed under the mental category(ies) indicated by the medical findings. However, we may also consider mental impairments under physical body system listings, using the concept of medical equivalence, when the mental disorder results in physical dysfunction. (See, for instance, 12.00D12 regarding the evaluation of anorexia nervosa and other eating disorders.)

The criteria in paragraphs B and C describe impairment-related functional limitations that are incompatible with the ability to do any gainful activity. The functional limitations in paragraphs B and C must be the result of the mental disorder described in the diagnostic description, that is manifested by the medical findings in paragraph A.

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The structure of the listing for mental retardation (12.05) is different from that of the other mental disorders listings. Listing 12.05 contains an introductory paragraph with the diagnostic description for mental retardation. It also contains four sets of criteria (paragraphs A through D). If your impairment satisfies the diagnostic description in the introductory paragraph and any one of the four sets of criteria, we will find that your impairment meets the listing. Paragraphs A and B contain criteria that describe disorders we consider severe enough to prevent your doing any gainful activity without any additional assessment of functional limitations. For paragraph C, we will assess the degree of functional limitation the additional impairment(s) imposes to determine if it significantly limits your physical or mental ability to do basic work activities, i.e., is a "severe" impairment(s), as defined in §§ 404.1520(c) and 416.920(c). If the additional impairment(s) does not cause limitations that are "severe" as defined in §§ 404.1520(c) and 416.920(c), we will not find that the additional impairment(s) imposes "an additional and significant work-related limitation of function," even if you are unable to do your past work because of the unique features of that work. Paragraph D contains the same functional criteria that are required under paragraph B of the other mental disorders listings.

The structure of the listing for substance addiction disorders, 12.09, is also different from that for the other mental disorder listings. Listing 12.09 is structured as a reference listing; that is, it will only serve to indicate which of the other listed mental or physical impairments must be used to evaluate the behavioral or physical changes resulting from regular use of addictive substances.

The listings are so constructed that an individual with an impairment(s) that meets or is equivalent in severity to the criteria of a listing could not reasonably be expected to do any gainful activity. These listings are only examples of common mental disorders that are considered severe enough to prevent an individual from doing any gainful activity. When you have a medically determinable severe mental impairment that does not satisfy the diagnostic description or the requirements of the paragraph A criteria of the relevant listing, the assessment of the paragraph B and C criteria is critical to a determination of equivalence.

If your impairment(s) does not meet or is not equivalent in severity to the criteria of any listing, you may or may not have the residual functional capacity (RFC) to do substantial gainful activity (SGA). The determination of mental RFC is crucial to the evaluation of your capacity to do SGA when your impairment(s) does not meet or equal the criteria of the listings, but is nevertheless severe.

RFC is a multidimensional description of the work-related abilities you retain in spite of your medical impairments. An assessment of your RFC complements the functional evaluation necessary for paragraphs B and C of the listings by requiring consideration of an expanded list of work-related capacities that may be affected by mental disorders when your impairment(s) is severe but neither meets nor is equivalent in severity to a listed mental disorder.

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B. *Need for medical evidence:* We must establish the existence of a medically determinable impairment(s) of the required duration by medical evidence consisting of symptoms, signs, and laboratory findings (including psychological test findings). Symptoms are your own description of your physical or mental impairment(s). Psychiatric signs are medically demonstrable phenomena that indicate specific psychological abnormalities, e.g., abnormalities of behavior, mood, thought, memory, orientation, development, or perception, as described by an appropriate medical source. Symptoms and signs generally cluster together to constitute recognizable mental disorders described in the listings. The symptoms and signs may be intermittent or continuous depending on the nature of the disorder.

C. *Assessment of severity:* We measure severity according to the functional limitations imposed by your medically determinable mental impairment(s). We assess functional limitations using the four criteria in paragraph B of the listings: Activities of daily living; social functioning; concentration, persistence, or pace; and episodes of decompensation. Where we use "marked" as a standard for measuring the degree of limitation, it means more than moderate but less than extreme. A marked limitation may arise when several activities or functions are impaired, or even when only one is impaired, as long as the degree of limitation is such as to interfere seriously with your ability to function independently, appropriately, effectively, and on a sustained basis. See §§ 404.1520a and 416.920a.

1. *Activities of daily living* include adaptive activities such as cleaning, shopping, cooking, taking public transportation, paying bills, maintaining a residence, caring appropriately for your grooming and hygiene, using telephones and directories, and using a post office. In the context of your overall situation, we assess the quality of these activities by their independence, appropriateness, effectiveness, and sustainability. We will determine the extent to which you are capable of initiating and participating in activities independent of supervision or direction.

We do not define "marked" by a specific number of activities of daily living in which functioning is impaired, but by the nature and overall degree of interference with function. For example, if you do a wide range of activities of daily living, we may still find that you have a marked limitation in your daily activities if you have serious difficulty performing them without direct supervision, or in a suitable manner, or on a consistent, useful, routine basis, or without undue interruptions or distractions.

2. *Social functioning* refers to your capacity to interact independently, appropriately, effectively, and on a sustained basis with other individuals. Social functioning includes the ability to get along with others, such as family members, friends, neighbors, grocery clerks, landlords, or bus drivers. You may demonstrate impaired social functioning by, for example, a history of altercations, evictions, firings, fear of strangers, avoidance of interpersonal relationships, or social isolation. You may exhibit strength in social functioning by such things as your ability to initiate social contacts with others, communicate clearly with others, or interact and actively participate in group activities. We also need to consider cooperative behaviors, consideration for others, awareness of

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others' feelings, and social maturity. Social functioning in work situations may involve interactions with the public, responding appropriately to persons in authority (e.g., supervisors), or cooperative behaviors involving coworkers.

We do not define "marked" by a specific number of different behaviors in which social functioning is impaired, but by the nature and overall degree of interference with function. For example, if you are highly antagonistic, uncooperative, or hostile but are tolerated by local storekeepers, we may nevertheless find that you have a marked limitation in social functioning because that behavior is not acceptable in other social contexts.

3. *Concentration, persistence or pace* refers to the ability to sustain focused attention and concentration sufficiently long to permit the timely and appropriate completion of tasks commonly found in work settings. Limitations in concentration, persistence, or pace are best observed in work settings, but may also be reflected by limitations in other settings. In addition, major limitations in this area can often be assessed through clinical examination or psychological testing. Wherever possible, however, a mental status examination or psychological test data should be supplemented by other available evidence.

On mental status examinations, concentration is assessed by tasks such as having you subtract serial sevens or serial threes from 100. In psychological tests of intelligence or memory, concentration is assessed through tasks requiring short-term memory or through tasks that must be completed within established time limits.

In work evaluations, concentration, persistence, or pace is assessed by testing your ability to sustain work using appropriate production standards, in either real or simulated work tasks (e.g., filing index cards, locating telephone numbers, or disassembling and reassembling objects). Strengths and weaknesses in areas of concentration and attention can be discussed in terms of your ability to work at a consistent pace for acceptable periods of time and until a task is completed, and your ability to repeat sequences of action to achieve a goal or an objective.

We must exercise great care in reaching conclusions about your ability or inability to complete tasks under the stresses of employment during a normal workday or workweek based on a time-limited mental status examination or psychological testing by a clinician, or based on your ability to complete tasks in other settings that are less demanding, highly structured, or more supportive. We must assess your ability to complete tasks by evaluating all the evidence, with an emphasis on how independently, appropriately, and effectively you are able to complete tasks on a sustained basis.

We do not define "marked" by a specific number of tasks that you are unable to complete, but by the nature and overall degree of interference with function. You may be able to sustain attention and persist at simple tasks but may still have difficulty with complicated tasks. Deficiencies that are apparent only in performing complex procedures or tasks would not satisfy the intent of this paragraph B criterion. However, if you can complete many simple tasks, we may nevertheless find that you have a marked

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limitation in concentration, persistence, or pace if you cannot complete these tasks without extra supervision or assistance, or in accordance with quality and accuracy standards, or at a consistent pace without an unreasonable number and length of rest periods, or without undue interruptions or distractions.

4. *Episodes of decompensation* are exacerbations or temporary increases in symptoms or signs accompanied by a loss of adaptive functioning, as manifested by difficulties in performing activities of daily living, maintaining social relationships, or maintaining concentration, persistence, or pace. Episodes of decompensation may be demonstrated by an exacerbation in symptoms or signs that would ordinarily require increased treatment or a less stressful situation (or a combination of the two). Episodes of decompensation may be inferred from medical records showing significant alteration in medication; or documentation of the need for a more structured psychological support system (e.g., hospitalizations, placement in a halfway house, or a highly structured and directing household); or other relevant information in the record about the existence, severity, and duration of the episode.

The term *repeated episodes of decompensation, each of extended duration* in these listings means three episodes within 1 year, or an average of once every 4 months, each lasting for at least 2 weeks. If you have experienced more frequent episodes of shorter duration or less frequent episodes of longer duration, we must use judgment to determine if the duration and functional effects of the episodes are of equal severity and may be used to substitute for the listed finding in a determination of equivalence.

D. Documentation: The evaluation of disability on the basis of a mental disorder requires sufficient evidence to (1) establish the presence of a medically determinable mental impairment(s), (2) assess the degree of functional limitation the impairment(s) imposes, and (3) project the probable duration of the impairment(s). See §§ 404.1512 and 416.912 for a discussion of what we mean by "evidence" and how we will assist you in developing your claim. Medical evidence must be sufficiently complete and detailed as to symptoms, signs, and laboratory findings to permit an independent determination. In addition, we will consider information from other sources when we determine how the established impairment(s) affects your ability to function. We will consider all relevant evidence in your case record.

1. *Sources of evidence.*

a. *Medical evidence.* There must be evidence from an acceptable medical source showing that you have a medically determinable mental impairment. See §§ 404.1508, 404.1513, 416.908, and 416.913. We will make every reasonable effort to obtain all relevant and available medical evidence about your mental impairment(s), including its history, and any records of mental status examination, psychological testing, and hospitalizations and treatment. Whenever possible, and appropriate, medical source evidence should reflect the medical source's considerations of information from you and other concerned persons who are aware of your activities of daily living; social functioning; concentration, persistence, or pace; or episodes of decompensation. Also,

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in accordance with standard clinical practice, any medical source assessment of your mental functioning should take into account any sensory, motor, or communication abnormalities, as well as your cultural and ethnic background.

b. *Information from the individual.* Individuals with mental impairments can often provide accurate descriptions of their limitations. The presence of a mental impairment does not automatically rule you out as a reliable source of information about your own functional limitations. When you have a mental impairment and are willing and able to describe your limitations, we will try to obtain such information from you. However, you may not be willing or able to fully or accurately describe the limitations resulting from your impairment(s). Thus, we will carefully examine the statements you provide to determine if they are consistent with the information about, or general pattern of, the impairment as described by the medical and other evidence, and to determine whether additional information about your functioning is needed from you or other sources.

c. *Other information.* Other professional health care providers (e.g., psychiatric nurse, psychiatric social worker) can normally provide valuable functional information, which should be obtained when available and needed. If necessary, information should also be obtained from nonmedical sources, such as family members and others who know you, to supplement the record of your functioning in order to establish the consistency of the medical evidence and longitudinality of impairment severity, as discussed in 12.00D2. Other sources of information about functioning include, but are not limited to, records from work evaluations and rehabilitation progress notes.

2. *Need for longitudinal evidence.* Your level of functioning may vary considerably over time. The level of your functioning at a specific time may seem relatively adequate or, conversely, rather poor. Proper evaluation of your impairment(s) must take into account any variations in the level of your functioning in arriving at a determination of severity over time. Thus, it is vital to obtain evidence from relevant sources over a sufficiently long period prior to the date of adjudication to establish your impairment severity.

3. *Work attempts.* You may have attempted to work or may actually have worked during the period of time pertinent to the determination of disability. This may have been an independent attempt at work or it may have been in conjunction with a community mental health or sheltered program, and it may have been of either short or long duration. Information concerning your behavior during any attempt to work and the circumstances surrounding termination of your work effort are particularly useful in determining your ability or inability to function in a work setting. In addition, we should also examine the degree to which you require special supports (such as those provided through supported employment or transitional employment programs) in order to work.

4. *Mental status examination.* The mental status examination is performed in the course of a clinical interview and is often partly assessed while the history is being obtained. A comprehensive mental status examination generally includes a narrative description of your appearance, behavior, and speech; thought process (e.g., loosening of associations); thought content (e.g., delusions); perceptual abnormalities (e.g.,

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hallucinations); mood and affect (e.g., depression, mania); sensorium and cognition (e.g., orientation, recall, memory, concentration, fund of information, and intelligence); and judgment and insight. The individual case facts determine the specific areas of mental status that need to be emphasized during the examination.

5. Psychological testing.

a. Reference to a "standardized psychological test" indicates the use of a psychological test measure that has appropriate validity, reliability, and norms, and is individually administered by a qualified specialist. By "qualified," we mean the specialist must be currently licensed or certified in the State to administer, score, and interpret psychological tests and have the training and experience to perform the test.

b. Psychological tests are best considered as standardized sets of tasks or questions designed to elicit a range of responses. Psychological testing can also provide other useful data, such as the specialist's observations regarding your ability to sustain attention and concentration, relate appropriately to the specialist, and perform tasks independently (without prompts or reminders). Therefore, a report of test results should include both the objective data and any clinical observations.

c. The salient characteristics of a good test are: (1) Validity, i.e., the test measures what it is supposed to measure; (2) reliability, i.e., the consistency of results obtained over time with the same test and the same individual; (3) appropriate normative data, i.e., individual test scores can be compared to test data from other individuals or groups of a similar nature, representative of that population; and (4) wide scope of measurement, i.e., the test should measure a broad range of facets/aspects of the domain being assessed. In considering the validity of a test result, we should note and resolve any discrepancies between formal test results and the individual's customary behavior and daily activities.

6. Intelligence tests.

a. The results of standardized intelligence tests may provide data that help verify the presence of mental retardation or organic mental disorder, as well as the extent of any compromise in cognitive functioning. However, since the results of intelligence tests are only part of the overall assessment, the narrative report that accompanies the test results should comment on whether the IQ scores are considered valid and consistent with the developmental history and the degree of functional limitation.

b. Standardized intelligence test results are essential to the adjudication of all cases of mental retardation that are not covered under the provisions of 12.05A. Listing 12.05A may be the basis for adjudicating cases where the results of standardized intelligence tests are unavailable, e.g., where your condition precludes formal standardized testing.

c. Due to such factors as differing means and standard deviations, identical IQ scores obtained from different tests do not always reflect a similar degree of intellectual functioning. The IQ scores in 12.05 reflect values from tests of general intelligence that

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have a mean of 100 and a standard deviation of 15; e.g., the Wechsler series. IQs obtained from standardized tests that deviate from a mean of 100 and a standard deviation of 15 require conversion to a percentile rank so that we can determine the actual degree of limitation reflected by the IQ scores. In cases where more than one IQ is customarily derived from the test administered, e.g., where verbal, performance, and full scale IQs are provided in the Wechsler series, we use the lowest of these in conjunction with 12.05.

d. Generally, it is preferable to use IQ measures that are wide in scope and include items that test both verbal and performance abilities. However, in special circumstances, such as the assessment of individuals with sensory, motor, or communication abnormalities, or those whose culture and background are not principally English-speaking, measures such as the Test of Nonverbal Intelligence, Third Edition (TONI-3), Leiter International Performance Scale-Revised (Leiter-R), or Peabody Picture Vocabulary Test-Third Edition (PPVT-III) may be used.

e. We may consider exceptions to formal standardized psychological testing when an individual qualified by training and experience to perform such an evaluation is not available, or in cases where appropriate standardized measures for your social, linguistic, and cultural background are not available. In these cases, the best indicator of severity is often the level of adaptive functioning and how you perform activities of daily living and social functioning.

7. *Personality measures and projective testing techniques.* Results from standardized personality measures, such as the Minnesota Multiphasic Personality Inventory-Revised (MMPI-II), or from projective types of techniques, such as the Rorschach and the Thematic Apperception Test (TAT), may provide useful data for evaluating several types of mental disorders. Such test results may be useful for disability evaluation when corroborated by other evidence, including results from other psychological tests and information obtained in the course of the clinical evaluation, from treating and other medical sources, other professional health care providers, and nonmedical sources. Any inconsistency between test results and clinical history and observation should be explained in the narrative description.

8. *Neuropsychological assessments.* Comprehensive neuropsychological examinations may be used to establish the existence and extent of compromise of brain function, particularly in cases involving organic mental disorders. Normally, these examinations include assessment of cerebral dominance, basic sensation and perception, motor speed and coordination, attention and concentration, visual-motor function, memory across verbal and visual modalities, receptive and expressive speech, higher-order linguistic operations, problem-solving, abstraction ability, and general intelligence. In addition, there should be a clinical interview geared toward evaluating pathological features known to occur frequently in neurological disease and trauma; e.g., emotional lability, abnormality of mood, impaired impulse control, passivity and apathy, or inappropriate social behavior. The specialist performing the examination may administer one of the commercially available comprehensive neuropsychological batteries, such as

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the Luria-Nebraska or the Halstead-Reitan, or a battery of tests selected as relevant to the suspected brain dysfunction. The specialist performing the examination must be properly trained in this area of neuroscience.

9. *Screening tests.* In conjunction with clinical examinations, sources may report the results of screening tests; i.e., tests used for gross determination of level of functioning. Screening instruments may be useful in uncovering potentially serious impairments, but often must be supplemented by other data. However, in some cases the results of screening tests may show such obvious abnormalities that further testing will clearly be unnecessary.

10. *Traumatic brain injury (TBI).* In cases involving TBI, follow the documentation and evaluation guidelines in 11.00F.

11. *Anxiety disorders.* In cases involving agoraphobia and other phobic disorders, panic disorders, and posttraumatic stress disorders, documentation of the anxiety reaction is essential. At least one detailed description of your typical reaction is required. The description should include the nature, frequency, and duration of any panic attacks or other reactions, the precipitating and exacerbating factors, and the functional effects. If the description is provided by a medical source, the reporting physician or psychologist should indicate the extent to which the description reflects his or her own observations and the source of any ancillary information. Statements of other persons who have observed you may be used for this description if professional observation is not available.

12. *Eating disorders.* In cases involving anorexia nervosa and other eating disorders, the primary manifestations may be mental or physical, depending upon the nature and extent of the disorder. When the primary functional limitation is physical; e.g., when severe weight loss and associated clinical findings are the chief cause of inability to work, we may evaluate the impairment under the appropriate physical body system listing. Of course, we must also consider any mental aspects of the impairment, unless we can make a fully favorable determination or decision based on the physical impairment(s) alone.

E. Chronic mental impairments. Particular problems are often involved in evaluating mental impairments in individuals who have long histories of repeated hospitalizations or prolonged outpatient care with supportive therapy and medication. For instance, if you have chronic organic, psychotic, and affective disorders, you may commonly have your life structured in such a way as to minimize your stress and reduce your symptoms and signs. In such a case, you may be much more impaired for work than your symptoms and signs would indicate. The results of a single examination may not adequately describe your sustained ability to function. It is, therefore, vital that we review all pertinent information relative to your condition, especially at times of increased stress. We will attempt to obtain adequate descriptive information from all sources that have treated you in the time period relevant to the determination or decision.

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F. *Effects of structured settings.* Particularly in cases involving chronic mental disorders, overt symptomatology may be controlled or attenuated by psychosocial factors such as placement in a hospital, halfway house, board and care facility, or other environment that provides similar structure. Highly structured and supportive settings may also be found your home. Such settings may greatly reduce the mental demands placed on you. With lowered mental demands, overt symptoms and signs of the underlying mental disorder may be minimized. At the same time, however, your ability to function outside of such a structured or supportive setting may not have changed. If your symptomatology is controlled or attenuated by psychosocial factors, we must consider your ability to function outside of such highly structured settings. For these reasons, identical paragraph C criteria are included in 12.02, 12.03, and 12.04. The paragraph C criterion of 12.06 reflects the uniqueness of agoraphobia, an anxiety disorder manifested by an overwhelming fear of leaving the home.

G. *Effects of medication.* We must give attention to the effects of medication on your symptoms, signs, and ability to function. While drugs used to modify psychological functions and mental states may control certain primary manifestations of a mental disorder, e.g., hallucinations, impaired attention, restlessness, or hyperactivity, such treatment may not affect all functional limitations imposed by the mental disorder. In cases where overt symptomatology is attenuated by the use of such drugs, particular attention must be focused on the functional limitations that may persist. We will consider these functional limitations in assessing impairment severity. See the paragraph C criteria in 12.02, 12.03, 12.04, and 12.06.

Drugs used in the treatment of some mental illnesses may cause drowsiness, blunted affect, or other side effects involving other body systems. We will consider such side effects when we evaluate the overall severity of your impairment. Where adverse effects of medications contribute to the impairment severity and the impairment(s) neither meets nor is equivalent in severity to any listing but is nonetheless severe, we will consider such adverse effects in the RFC assessment.

H. *Effects of treatment.* With adequate treatment some individuals with chronic mental disorders not only have their symptoms and signs ameliorated, but they also return to a level of function close to the level of function they had before they developed symptoms or signs of their mental disorders. Treatment may or may not assist in the achievement of a level of adaptation adequate to perform sustained SGA. See the paragraph C criteria in 12.02, 12.03, 12.04, and 12.06.

I. *Technique for reviewing evidence in mental disorders claims to determine the level of impairment severity.* We have developed a special technique to ensure that we obtain, consider, and properly evaluate all the evidence we need to evaluate impairment severity in claims involving mental impairment(s). We explain this technique in §§ 404.1520a and 416.920a.

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12.01 Category of Impairments, Mental

12.02 *Organic mental disorders:* Psychological or behavioral abnormalities associated with a dysfunction of the brain. History and physical examination or laboratory tests demonstrate the presence of a specific organic factor judged to be etiologically related to the abnormal mental state and loss of previously acquired functional abilities.

The required level of severity for these disorders is met when the requirements in both A and B are satisfied, or when the requirements in C are satisfied.

A. Demonstration of a loss of specific cognitive abilities or affective changes and the medically documented persistence of at least one of the following:

1. Disorientation to time and place; or
2. Memory impairment, either short-term (inability to learn new information), intermediate, or long-term (inability to remember information that was known sometime in the past); or
3. Perceptual or thinking disturbances (e.g., hallucinations, delusions); or
4. Change in personality; or
5. Disturbance in mood; or
6. Emotional lability (e.g., explosive temper outbursts, sudden crying, etc.) and impairment in impulse control; or
7. Loss of measured intellectual ability of at least 15 I.Q. points from premorbid levels or overall impairment index clearly within the severely impaired range on neuropsychological testing, e.g., Luria-Nebraska, Halstead-Reitan, etc;

AND

B. Resulting in at least two of the following:

1. Marked restriction of activities of daily living; or
2. Marked difficulties in maintaining social functioning; or
3. Marked difficulties in maintaining concentration, persistence, or pace; or
4. Repeated episodes of decompensation, each of extended duration;

OR

C. Medically documented history of a chronic organic mental disorder of at least 2 years' duration that has caused more than a minimal limitation of ability to do basic work

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activities, with symptoms or signs currently attenuated by medication or psychosocial support, and one of the following:

1. Repeated episodes of decompensation, each of extended duration; or
2. A residual disease process that has resulted in such marginal adjustment that even a minimal increase in mental demands or change in the environment would be predicted to cause the individual to decompensate; or
3. Current history of 1 or more years' inability to function outside a highly supportive living arrangement, with an indication of continued need for such an arrangement.

12.03 *Schizophrenic, paranoid and other psychotic disorders:* Characterized by the onset of psychotic features with deterioration from a previous level of functioning.

The required level of severity for these disorders is met when the requirements in both A and B are satisfied, or when the requirements in C are satisfied.

A. Medically documented persistence, either continuous or intermittent, of one or more of the following:

1. Delusions or hallucinations; or
2. Catatonic or other grossly disorganized behavior; or
3. Incoherence, loosening of associations, illogical thinking, or poverty of content of speech if associated with one of the following:
 - a. Blunt affect; or
 - b. Flat affect; or
 - c. Inappropriate affect;

or

4. Emotional withdrawal and/or isolation;

AND

B. Resulting in at least two of the following:

1. Marked restriction of activities of daily living; or
2. Marked difficulties in maintaining social functioning; or
3. Marked difficulties in maintaining concentration, persistence, or pace; or
4. Repeated episodes of decompensation, each of extended duration;

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OR

C. Medically documented history of a chronic schizophrenic, paranoid, or other psychotic disorder of at least 2 years' duration that has caused more than a minimal limitation of ability to do basic work activities, with symptoms or signs currently attenuated by medication or psychosocial support, and one of the following:

1. Repeated episodes of decompensation, each of extended duration; or
2. A residual disease process that has resulted in such marginal adjustment that even a minimal increase in mental demands or change in the environment would be predicted to cause the individual to decompensate; or
3. Current history of 1 or more years' inability to function outside a highly supportive living arrangement, with an indication of continued need for such an arrangement.

12.04 Affective disorders: Characterized by a disturbance of mood, accompanied by a full or partial manic or depressive syndrome. Mood refers to a prolonged emotion that colors the whole psychic life; it generally involves either depression or elation.

The required level of severity for these disorders is met when the requirements in both A and B are satisfied, or when the requirements in C are satisfied.

A. Medically documented persistence, either continuous or intermittent, of one of the following:

1. Depressive syndrome characterized by at least four of the following:
 - a. Anhedonia or pervasive loss of interest in almost all activities; or
 - b. Appetite disturbance with change in weight; or
 - c. Sleep disturbance; or
 - d. Psychomotor agitation or retardation; or
 - e. Decreased energy; or
 - f. Feelings of guilt or worthlessness; or
 - g. Difficulty concentrating or thinking; or
 - h. Thoughts of suicide; or
 - i. Hallucinations, delusions, or paranoid thinking; or
2. Manic syndrome characterized by at least three of the following:
 - a. Hyperactivity; or

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- b. Pressure of speech; or
 - c. Flight of ideas; or
 - d. Inflated self-esteem; or
 - e. Decreased need for sleep; or
 - f. Easy distractibility; or
 - g. Involvement in activities that have a high probability of painful consequences which are not recognized; or
 - h. Hallucinations, delusions or paranoid thinking; or
3. Bipolar syndrome with a history of episodic periods manifested by the full symptomatic picture of both manic and depressive syndromes (and currently characterized by either or both syndromes);

AND

B. Resulting in at least two of the following:

- 1. Marked restriction of activities of daily living; or
- 2. Marked difficulties in maintaining social functioning; or
- 3. Marked difficulties in maintaining concentration, persistence, or pace; or
- 4. Repeated episodes of decompensation, each of extended duration;

OR

C. Medically documented history of a chronic affective disorder of at least 2 years' duration that has caused more than a minimal limitation of ability to do basic work activities, with symptoms or signs currently attenuated by medication or psychosocial support, and one of the following:

- 1. Repeated episodes of decompensation, each of extended duration; or
- 2. A residual disease process that has resulted in such marginal adjustment that even a minimal increase in mental demands or change in the environment would be predicted to cause the individual to decompensate; or
- 3. Current history of 1 or more years' inability to function outside a highly supportive living arrangement, with an indication of continued need for such an arrangement.

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12.05 *Mental retardation*: Mental retardation refers to significantly subaverage general intellectual functioning with deficits in adaptive functioning initially manifested during the developmental period; i.e., the evidence demonstrates or supports onset of the impairment before age 22.

The required level of severity for this disorder is met when the requirements in A, B, C, or D are satisfied.

A. Mental incapacity evidenced by dependence upon others for personal needs (e.g., toileting, eating, dressing, or bathing) and inability to follow directions, such that the use of standardized measures of intellectual functioning is precluded;

OR

B. A valid verbal, performance, or full scale IQ of 59 or less;

OR

C. A valid verbal, performance, or full scale IQ of 60 through 70 and a physical or other mental impairment imposing an additional and significant work-related limitation of function;

OR

D. A valid verbal, performance, or full scale IQ of 60 through 70, resulting in at least two of the following:

1. Marked restriction of activities of daily living; or
2. Marked difficulties in maintaining social functioning; or
3. Marked difficulties in maintaining concentration, persistence, or pace; or
4. Repeated episodes of decompensation, each of extended duration.

12.06 *Anxiety-related disorders*: In these disorders anxiety is either the predominant disturbance or it is experienced if the individual attempts to master symptoms; for example, confronting the dreaded object or situation in a phobic disorder or resisting the obsessions or compulsions in obsessive compulsive disorders.

The required level of severity for these disorders is met when the requirements in both A and B are satisfied, or when the requirements in both A and C are satisfied.

A. Medically documented findings of at least one of the following:

1. Generalized persistent anxiety accompanied by three out of four of the following signs or symptoms:

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- a. Motor tension; or
 - b. Autonomic hyperactivity; or
 - c. Apprehensive expectation; or
 - d. Vigilance and scanning; or
2. A persistent irrational fear of a specific object, activity, or situation which results in a compelling desire to avoid the dreaded object, activity, or situation; or
3. Recurrent severe panic attacks manifested by a sudden unpredictable onset of intense apprehension, fear, terror and sense of impending doom occurring on the average of at least once a week; or
4. Recurrent obsessions or compulsions which are a source of marked distress; or
5. Recurrent and intrusive recollections of a traumatic experience, which are a source of marked distress;

AND

B. Resulting in at least two of the following:

- 1. Marked restriction of activities of daily living; or
- 2. Marked difficulties in maintaining social functioning; or
- 3. Marked difficulties in maintaining concentration, persistence, or pace; or
- 4. Repeated episodes of decompensation, each of extended duration.

OR

C. Resulting in complete inability to function independently outside the area of one's home.

12.07 *Somatoform disorders:* Physical symptoms for which there are no demonstrable organic findings or known physiological mechanisms.

The required level of severity for these disorders is met when the requirements in both A and B are satisfied.

A. Medically documented by evidence of one of the following:

- 1. A history of multiple physical symptoms of several years duration, beginning before age 30, that have caused the individual to take medicine frequently, see a physician often and alter life patterns significantly; or

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2. Persistent nonorganic disturbance of one of the following:
 - a. Vision, or
 - b. Speech; or
 - c. Hearing; or
 - d. Use of a limb; or
 - e. Movement and its control (e.g., coordination disturbance, psychogenic seizures, akinesia, dyskinesia; or
 - f. Sensation (e.g., diminished or heightened).
3. Unrealistic interpretation of physical signs or sensations associated with the preoccupation or belief that one has a serious disease or injury;

AND

- B.** Resulting in at least two of the following:
1. Marked restriction of activities of daily living; or
 2. Marked difficulties in maintaining social functioning; or
 3. Marked difficulties in maintaining concentration, persistence, or pace; or
 4. Repeated episodes of decompensation, each of extended duration.

12.08 *Personality disorders:* A personality disorder exists when personality traits are inflexible and maladaptive and cause either significant impairment in social or occupational functioning or subjective distress. Characteristic features are typical of the individual's long-term functioning and are not limited to discrete episodes of illness.

The required level of severity for these disorders is met when the requirements in both A and B are satisfied.

A. Deeply ingrained, maladaptive patterns of behavior associated with one of the following:

1. Seclusiveness or autistic thinking; or
2. Pathologically inappropriate suspiciousness or hostility; or
3. Oddities of thought, perception, speech and behavior; or
4. Persistent disturbances of mood or affect; or

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5. Pathological dependence, passivity, or aggressivity; or
6. Intense and unstable interpersonal relationships and impulsive and damaging behavior;

AND

B. Resulting in at least two of the following:

1. Marked restriction of activities of daily living; or
2. Marked difficulties in maintaining social functioning; or
3. Marked difficulties in maintaining concentration, persistence, or pace; or
4. Repeated episodes of decompensation, each of extended duration.

12.09 *Substance addiction disorders:* Behavioral changes or physical changes associated with the regular use of substances that affect the central nervous system.

The required level of severity for these disorders is met when the requirements in any of the following (A through I) are satisfied.

- A. Organic mental disorders. Evaluate under 12.02.
- B. Depressive syndrome. Evaluate under 12.04.
- C. Anxiety disorders. Evaluate under 12.06.
- D. Personality disorders. Evaluate under 12.08.
- E. Peripheral neuropathies. Evaluate under 11.14.
- F. Liver damage. Evaluate under 5.05.
- G. Gastritis. Evaluate under 5.00.
- H. Pancreatitis. Evaluate under 5.08.
- I. Seizures. Evaluate under 11.02 or 11.03.

12.10 *Autistic disorder and other pervasive developmental disorders:*

Characterized by qualitative deficits in the development of reciprocal social interaction, in the development of verbal and nonverbal communication skills, and in imaginative activity. Often, there is a markedly restricted repertoire of activities and interests, which frequently are stereotyped and repetitive.

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The required level of severity for these disorders is met when the requirements in both A and B are satisfied.

A. Medically documented findings of the following:

1. For autistic disorder, all of the following:

- a. Qualitative deficits in reciprocal social interaction; and
- b. Qualitative deficits in verbal and nonverbal communication and in imaginative activity; and
- c. Markedly restricted repertoire of activities and interests;

OR

2. For other pervasive developmental disorders, both of the following:

- a. Qualitative deficits in reciprocal social interaction; and
- b. Qualitative deficits in verbal and nonverbal communication and in imaginative activity;

AND

B. Resulting in at least two of the following:

- 1. Marked restriction of activities of daily living; or
- 2. Marked difficulties in maintaining social functioning; or
- 3. Marked difficulties in maintaining concentration, persistence, or pace; or
- 4. Repeated episodes of decompensation, each of extended duration.

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Mental Cognitive Roundtable – Excerpts from the Code of Federal Regulations (CFR)

Residual Functional Capacity

§404.1545 [and 416.945] Your residual functional capacity.

(a) *General*—(1) *Residual functional capacity assessment.* Your impairment(s), and any related symptoms, such as pain, may cause physical and mental limitations that affect what you can do in a work setting. Your residual functional capacity is the most you can still do despite your limitations. We will assess your residual functional capacity based on all the relevant evidence in your case record. (See §404.1546.)

(2) *If you have more than one impairment.* We will consider all of your medically determinable impairments of which we are aware, including your medically determinable impairments that are not "severe," as explained in §§404.1520(c), 404.1521, and 404.1523, when we assess your residual functional capacity. (See paragraph (e) of this section.)

(3) *Evidence we use to assess your residual functional capacity.* We will assess your residual functional capacity based on all of the relevant medical and other evidence. In general, you are responsible for providing the evidence we will use to make a finding about your residual functional capacity. (See §404.1512(c).) However, before we make a determination that you are not disabled, we are responsible for developing your complete medical history, including arranging for a consultative examination(s) if necessary, and making every reasonable effort to help you get medical reports from your own medical sources. (See §§404.1512(d) through (f).) We will consider any statements about what you can still do that have been provided by medical sources, whether or not they are based on formal medical examinations. (See §404.1513.) We will also consider descriptions and observations of your limitations from your impairment(s), including limitations that result from your symptoms, such as pain, provided by you, your family, neighbors, friends, or other persons. (See paragraph (e) of this section and §404.1529.)

(4) *What we will consider in assessing residual functional capacity.* When we assess your residual functional capacity, we will consider your ability to meet the physical, mental, sensory, and other requirements of work, as described in paragraphs (b), (c), and (d) of this section.

(5) *How we will use our residual functional capacity assessment.* (i) We will first use our residual functional capacity assessment at step four of the sequential evaluation process to decide if you can do your past relevant work. (See §§404.1520(f) and 404.1560(b).)

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(ii) If we find that you cannot do your past relevant work (or you do not have any past relevant work), we will use the same assessment of your residual functional capacity at step five of the sequential evaluation process to decide if you can make an adjustment to any other work that exists in the national economy. (See §§404.1520(g) and 404.1566.) At this step, we will not use our assessment of your residual functional capacity alone to decide if you are disabled. We will use the guidelines in §§404.1560 through 404.1569a, and consider our residual functional capacity assessment together with the information about your vocational background to make our disability determination or decision. For our rules on residual functional capacity assessment in deciding whether your disability continues or ends, see §404.1594.

(b) *Physical abilities.* When we assess your physical abilities, we first assess the nature and extent of your physical limitations and then determine your residual functional capacity for work activity on a regular and continuing basis. A limited ability to perform certain physical demands of work activity, such as sitting, standing, walking, lifting, carrying, pushing, pulling, or other physical functions (including manipulative or postural functions, such as reaching, handling, stooping or crouching), may reduce your ability to do past work and other work.

(c) *Mental abilities.* When we assess your mental abilities, we first assess the nature and extent of your mental limitations and restrictions and then determine your residual functional capacity for work activity on a regular and continuing basis. A limited ability to carry out certain mental activities, such as limitations in understanding, remembering, and carrying out instructions, and in responding appropriately to supervision, co-workers, and work pressures in a work setting, may reduce your ability to do past work and other work.

(d) *Other abilities affected by impairment(s).* Some medically determinable impairment(s), such as skin impairment(s), epilepsy, impairment(s) of vision, hearing or other senses, and impairment(s) which impose environmental restrictions, may cause limitations and restrictions which affect other work-related abilities. If you have this type of impairment(s), we consider any resulting limitations and restrictions which may reduce your ability to do past work and other work in deciding your residual functional capacity.

(e) *Total limiting effects.* When you have a severe impairment(s), but your symptoms, signs, and laboratory findings do not meet or equal those of a listed impairment in appendix 1 of this subpart, we will consider the limiting effects of all your impairment(s), even those that are not severe, in determining your residual functional capacity. Pain or other symptoms may cause a limitation of function beyond that which can be determined on the basis of the anatomical, physiological or psychological abnormalities considered alone; e.g., someone with a low back disorder may be fully capable of the physical demands consistent with those of sustained medium work activity, but another person with the same disorder, because of pain, may not be capable of more than the physical demands consistent with those of light work activity on a sustained basis. In assessing the total limiting effects of your impairment(s) and any related symptoms, we

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will consider all of the medical and nonmedical evidence, including the information described in §404.1529(c).

Vocational Considerations

§404.1560 When we will consider your vocational background.

(a) *General.* If you are applying for a period of disability, or disability insurance benefits as a disabled worker, or child's insurance benefits based on disability which began before age 22, or widow's or widower's benefits based on disability for months after December 1990, and we cannot decide whether you are disabled at one of the first three steps of the sequential evaluation process (see §404.1520), we will consider your residual functional capacity together with your vocational background, as discussed in paragraphs (b) and (c) of this section.

(b) *Past relevant work.* We will first compare our assessment of your residual functional capacity with the physical and mental demands of your past relevant work.

(1) *Definition of past relevant work.* Past relevant work is work that you have done within the past 15 years, that was substantial gainful activity, and that lasted long enough for you to learn to do it. (See §404.1565(a).)

(2) *Determining whether you can do your past relevant work.* We will ask you for information about work you have done in the past. We may also ask other people who know about your work. (See §404.1565(b).) We may use the services of vocational experts or vocational specialists, or other resources, such as the "Dictionary of Occupational Titles" and its companion volumes and supplements, published by the Department of Labor, to obtain evidence we need to help us determine whether you can do your past relevant work, given your residual functional capacity. A vocational expert or specialist may offer relevant evidence within his or her expertise or knowledge concerning the physical and mental demands of a claimant's past relevant work, either as the claimant actually performed it or as generally performed in the national economy. Such evidence may be helpful in supplementing or evaluating the accuracy of the claimant's description of his past work. In addition, a vocational expert or specialist may offer expert opinion testimony in response to a hypothetical question about whether a person with the physical and mental limitations imposed by the claimant's medical impairment(s) can meet the demands of the claimant's previous work, either as the claimant actually performed it or as generally performed in the national economy.

(3) *If you can do your past relevant work.* If we find that you have the residual functional capacity to do your past relevant work, we will determine that you can still do your past work and are not disabled. We will not consider your vocational factors of age, education, and work experience or whether your past relevant work exists in significant numbers in the national economy.

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(c) *Other work.* (1) If we find that your residual functional capacity is not enough to enable you to do any of your past relevant work, we will use the same residual functional capacity assessment we used to decide if you could do your past relevant work when we decide if you can adjust to any other work. We will look at your ability to adjust to other work by considering your residual functional capacity and your vocational factors of age, education, and work experience. Any other work (jobs) that you can adjust to must exist in significant numbers in the national economy (either in the region where you live or in several regions in the country).

(2) In order to support a finding that you are not disabled at this fifth step of the sequential evaluation process, we are responsible for providing evidence that demonstrates that other work exists in significant numbers in the national economy that you can do, given your residual functional capacity and vocational factors. We are not responsible for providing additional evidence about your residual functional capacity because we will use the same residual functional capacity assessment that we used to determine if you can do your past relevant work.

§404.1563 Your age as a vocational factor.

(a) *General.* "Age" means your chronological age. When we decide whether you are disabled under §404.1520(g)(1), we will consider your chronological age in combination with your residual functional capacity, education, and work experience. We will not consider your ability to adjust to other work on the basis of your age alone. In determining the extent to which age affects a person's ability to adjust to other work, we consider advancing age to be an increasingly limiting factor in the person's ability to make such an adjustment, as we explain in paragraphs (c) through (e) of this section. If you are unemployed but you still have the ability to adjust to other work, we will find that you are not disabled. In paragraphs (b) through (e) of this section and in appendix 2 to this subpart, we explain in more detail how we consider your age as a vocational factor.

(b) *How we apply the age categories.* When we make a finding about your ability to do other work under §404.1520(f)(1), we will use the age categories in paragraphs (c) through (e) of this section. We will use each of the age categories that applies to you during the period for which we must determine if you are disabled. We will not apply the age categories mechanically in a borderline situation. If you are within a few days to a few months of reaching an older age category, and using the older age category would result in a determination or decision that you are disabled, we will consider whether to use the older age category after evaluating the overall impact of all the factors of your case.

(c) *Younger person.* If you are a younger person (under age 50), we generally do not consider that your age will seriously affect your ability to adjust to other work. However, in some circumstances, we consider that persons age 45-49 are more limited in their ability to adjust to other work than persons who have not attained age 45. See Rule 201.17 in appendix 2.

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(d) *Person closely approaching advanced age.* If you are closely approaching advanced age (age 50-54), we will consider that your age along with a severe impairment(s) and limited work experience may seriously affect your ability to adjust to other work.

(e) *Person of advanced age.* We consider that at advanced age (age 55 or older) age significantly affects a person's ability to adjust to other work. We have special rules for persons of advanced age and for persons in this category who are closely approaching retirement age (age 60-64). See §404.1568(d)(4).

(f) *Information about your age.* We will usually not ask you to prove your age. However, if we need to know your exact age to determine whether you get disability benefits or if the amount of your benefit will be affected, we will ask you for evidence of your age.

§404.1564 Your education as a vocational factor.

(a) *General.* Education is primarily used to mean formal schooling or other training which contributes to your ability to meet vocational requirements, for example, reasoning ability, communication skills, and arithmetical ability. However, if you do not have formal schooling, this does not necessarily mean that you are uneducated or lack these abilities. Past work experience and the kinds of responsibilities you had when you were working may show that you have intellectual abilities, although you may have little formal education. Your daily activities, hobbies, or the results of testing may also show that you have significant intellectual ability that can be used to work.

(b) *How we evaluate your education.* The importance of your educational background may depend upon how much time has passed between the completion of your formal education and the beginning of your physical or mental impairment(s) and by what you have done with your education in a work or other setting. Formal education that you completed many years before your impairment began, or unused skills and knowledge that were a part of your formal education, may no longer be useful or meaningful in terms of your ability to work. Therefore, the numerical grade level that you completed in school may not represent your actual educational abilities. These may be higher or lower. However, if there is no other evidence to contradict it, we will use your numerical grade level to determine your educational abilities. The term *education* also includes how well you are able to communicate in English since this ability is often acquired or improved by education. In evaluating your educational level, we use the following categories:

(1) *Illiteracy.* Illiteracy means the inability to read or write. We consider someone illiterate if the person cannot read or write a simple message such as instructions or inventory lists even though the person can sign his or her name. Generally, an illiterate person has had little or no formal schooling.

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(2) *Marginal education.* Marginal education means ability in reasoning, arithmetic, and language skills which are needed to do simple, unskilled types of jobs. We generally consider that formal schooling at a 6th grade level or less is a marginal education.

(3) *Limited education.* Limited education means ability in reasoning, arithmetic, and language skills, but not enough to allow a person with these educational qualifications to do most of the more complex job duties needed in semi-skilled or skilled jobs. We generally consider that a 7th grade through the 11th grade level of formal education is a limited education.

(4) *High school education and above.* High school education and above means abilities in reasoning, arithmetic, and language skills acquired through formal schooling at a 12th grade level or above. We generally consider that someone with these educational abilities can do semi-skilled through skilled work.

(5) *Inability to communicate in English.* Since the ability to speak, read and understand English is generally learned or increased at school, we may consider this an educational factor. Because English is the dominant language of the country, it may be difficult for someone who doesn't speak and understand English to do a job, regardless of the amount of education the person may have in another language. Therefore, we consider a person's ability to communicate in English when we evaluate what work, if any, he or she can do. It generally doesn't matter what other language a person may be fluent in.

(6) *Information about your education.* We will ask you how long you attended school and whether you are able to speak, understand, read and write in English and do at least simple calculations in arithmetic. We will also consider other information about how much formal or informal education you may have had through your previous work, community projects, hobbies, and any other activities which might help you to work.

§404.1565 Your work experience as a vocational factor.

(a) *General.* *Work experience* means skills and abilities you have acquired through work you have done which show the type of work you may be expected to do. Work you have already been able to do shows the kind of work that you may be expected to do. We consider that your work experience applies when it was done within the last 15 years, lasted long enough for you to learn to do it, and was substantial gainful activity. We do not usually consider that work you did 15 years or more before the time we are deciding whether you are disabled (or when the disability insured status requirement was last met, if earlier) applies. A gradual change occurs in most jobs so that after 15 years it is no longer realistic to expect that skills and abilities acquired in a job done then continue to apply. The 15-year guide is intended to insure that remote work experience is not currently applied. If you have no work experience or worked only "off-and-on" or for brief periods of time during the 15-year period, we generally consider that these do not apply. If you have acquired skills through your past work, we consider you to have these work skills unless you cannot use them in other skilled or semi-skilled work that you can now

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do. If you cannot use your skills in other skilled or semi-skilled work, we will consider your work background the same as unskilled. However, even if you have no work experience, we may consider that you are able to do unskilled work because it requires little or no judgment and can be learned in a short period of time.

(b) *Information about your work.* Under certain circumstances, we will ask you about the work you have done in the past. If you cannot give us all of the information we need, we will try, with your permission, to get it from your employer or other person who knows about your work, such as a member of your family or a co-worker. When we need to consider your work experience to decide whether you are able to do work that is different from what you have done in the past, we will ask you to tell us about all of the jobs you have had in the last 15 years. You must tell us the dates you worked, all of the duties you did, and any tools, machinery, and equipment you used. We will need to know about the amount of walking, standing, sitting, lifting and carrying you did during the work day, as well as any other physical or mental duties of your job. If all of your work in the past 15 years has been arduous and unskilled, and you have very little education, we will ask you to tell us about all of your work from the time you first began working. This information could help you to get disability benefits.

§404.1566 Work which exists in the national economy.

(a) *General.* We consider that work exists in the national economy when it exists in significant numbers either in the region where you live or in several other regions of the country. It does not matter whether—

- (1) Work exists in the immediate area in which you live;
- (2) A specific job vacancy exists for you; or
- (3) You would be hired if you applied for work.

(b) *How we determine the existence of work.* Work exists in the national economy when there is a significant number of jobs (in one or more occupations) having requirements which you are able to meet with your physical or mental abilities and vocational qualifications. Isolated jobs that exist only in very limited numbers in relatively few locations outside of the region where you live are not considered "work which exists in the national economy". We will not deny you disability benefits on the basis of the existence of these kinds of jobs. If work that you can do does not exist in the national economy, we will determine that you are disabled. However, if work that you can do does exist in the national economy, we will determine that you are not disabled.

(c) *Inability to obtain work.* We will determine that you are not disabled if your residual functional capacity and vocational abilities make it possible for you to do work which exists in the national economy, but you remain unemployed because of—

- (1) Your inability to get work;

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- (2) Lack of work in your local area;
- (3) The hiring practices of employers;
- (4) Technological changes in the industry in which you have worked;
- (5) Cyclical economic conditions;
- (6) No job openings for you;
- (7) You would not actually be hired to do work you could otherwise do; or
- (8) You do not wish to do a particular type of work.

(d) *Administrative notice of job data.* When we determine that unskilled, sedentary, light, and medium jobs exist in the national economy (in significant numbers either in the region where you live or in several regions of the country), we will take administrative notice of reliable job information available from various governmental and other publications. For example, we will take notice of—

- (1) *Dictionary of Occupational Titles*, published by the Department of Labor;
- (2) *County Business Patterns*, published by the Bureau of the Census;
- (3) *Census Reports*, also published by the Bureau of the Census;
- (4) *Occupational Analyses*, prepared for the Social Security Administration by various State employment agencies; and
- (5) *Occupational Outlook Handbook*, published by the Bureau of Labor Statistics.

(e) *Use of vocational experts and other specialists.* If the issue in determining whether you are disabled is whether your work skills can be used in other work and the specific occupations in which they can be used, or there is a similarly complex issue, we may use the services of a vocational expert or other specialist. We will decide whether to use a vocational expert or other specialist.

§404.1568 Skill requirements.

In order to evaluate your skills and to help determine the existence in the national economy of work you are able to do, occupations are classified as unskilled, semi-skilled, and skilled. In classifying these occupations, we use materials published by the Department of Labor. When we make disability determinations under this subpart, we use the following definitions:

(a) *Unskilled work.* Unskilled work is work which needs little or no judgment to do simple duties that can be learned on the job in a short period of time. The job may or may not require considerable strength. For example, we consider jobs unskilled if the primary

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work duties are handling, feeding and offbearing (that is, placing or removing materials from machines which are automatic or operated by others), or machine tending, and a person can usually learn to do the job in 30 days, and little specific vocational preparation and judgment are needed. A person does not gain work skills by doing unskilled jobs.

(b) *Semi-skilled work*. Semi-skilled work is work which needs some skills but does not require doing the more complex work duties. Semi-skilled jobs may require alertness and close attention to watching machine processes; or inspecting, testing or otherwise looking for irregularities; or tending or guarding equipment, property, materials, or persons against loss, damage or injury; or other types of activities which are similarly less complex than skilled work, but more complex than unskilled work. A job may be classified as semi-skilled where coordination and dexterity are necessary, as when hands or feet must be moved quickly to do repetitive tasks.

(c) *Skilled work*. Skilled work requires qualifications in which a person uses judgment to determine the machine and manual operations to be performed in order to obtain the proper form, quality, or quantity of material to be produced. Skilled work may require laying out work, estimating quality, determining the suitability and needed quantities of materials, making precise measurements, reading blueprints or other specifications, or making necessary computations or mechanical adjustments to control or regulate the work. Other skilled jobs may require dealing with people, facts, or figures or abstract ideas at a high level of complexity.

(d) *Skills that can be used in other work (transferability)*—(1) *What we mean by transferable skills*. We consider you to have skills that can be used in other jobs, when the skilled or semi-skilled work activities you did in past work can be used to meet the requirements of skilled or semi-skilled work activities of other jobs or kinds of work. This depends largely on the similarity of occupationally significant work activities among different jobs.

(2) *How we determine skills that can be transferred to other jobs*. Transferability is most probable and meaningful among jobs in which—

- (i) The same or a lesser degree of skill is required;
- (ii) The same or similar tools and machines are used; and
- (iii) The same or similar raw materials, products, processes, or services are involved.

(3) *Degrees of transferability*. There are degrees of transferability of skills ranging from very close similarities to remote and incidental similarities among jobs. A complete similarity of all three factors is not necessary for transferability. However, when skills are so specialized or have been acquired in such an isolated vocational setting (like many jobs in mining, agriculture, or fishing) that they are not readily usable in other industries, jobs, and work settings, we consider that they are not transferable.

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(4) *Transferability of skills for individuals of advanced age.* If you are of advanced age (age 55 or older), and you have a severe impairment(s) that limits you to *sedentary* or *light* work, we will find that you cannot make an adjustment to other work unless you have skills that you can transfer to other skilled or semiskilled work (or you have recently completed education which provides for direct entry into skilled work) that you can do despite your impairment(s). We will decide if you have transferable skills as follows. If you are of advanced age and you have a severe impairment(s) that limits you to no more than *sedentary* work, we will find that you have skills that are transferable to skilled or semiskilled sedentary work only if the sedentary work is so similar to your previous work that you would need to make very little, if any, vocational adjustment in terms of tools, work processes, work settings, or the industry. (See §404.1567(a) and §201.00(f) of appendix 2.) If you are of advanced age but have not attained age 60, and you have a severe impairment(s) that limits you to no more than *light* work, we will apply the rules in paragraphs (d)(1) through (d)(3) of this section to decide if you have skills that are transferable to skilled or semiskilled light work (see §404.1567(b)). If you are *closely approaching retirement age* (age 60-64) and you have a severe impairment(s) that limits you to no more than *light* work, we will find that you have skills that are transferable to skilled or semiskilled light work only if the light work is so similar to your previous work that you would need to make very little, if any, vocational adjustment in terms of tools, work processes, work settings, or the industry. (See §404.1567(b) and Rule 202.00(f) of appendix 2 to this subpart.)

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Appendix C – 8

**Mental Cognitive Roundtable – Agency Instructions
for Completing the Mental Residual Functional Capacity Assessment (MRFC)
Relevant Program Operating Manual System (POMS) Instructions for
Completion of the Mental Residual Functional Assessment Form**

DI 24510.060 Mental Residual Functional Capacity Assessment

A. Operating Policy

1. SPECIAL FORM

Because of the complexity of mental disorder evaluation, a **special Form SSA-4734-F4-SUP** is to be used to document the mental residual functional capacity (RFC) decision, i.e., what an individual can do despite his /her impairment.

2. MEDICAL CONSULTANT COMPLETION

a. Unfavorable and Partially Favorable Decisions

In decisions that are not fully favorable, only a psychiatrist or psychologist is to perform the analysis and decide the mental functional capacity.

b. Fully Favorable Decisions

In fully favorable determinations, the medical consultant (MC) who completes the mental RFC assessment, to the extent possible, should be a psychiatrist or psychologist.

c. When Physical Impairment Involved

Refer the claim to a physician of the appropriate medical specialty after all mental RFC considerations have been accomplished.

B. Description of Form SSA-4734-F4-SUP

Form SSA-4734-F4-SUP is divided into four sections:

- Heading,
- Section I, Summary Conclusions,

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- Section II, Remarks,
- Section III, Functional Capacity Assessment and MC signature.

1. HEADING

The **Heading** provides space to record claimant and claim identification data.

2. SECTION I

Section I—Summary Conclusions is designed to record the MC's analysis of the evidence and his/her conclusions about:

- The presence and degree of specific functional limitations, and the adequacy of documentation.
 - a. **Section I is merely a worksheet** to aid in deciding the presence and degree of functional limitations and the adequacy of documentation and **does not constitute the RFC assessment.**
 - b. **Twenty mental function items** are grouped under **four main categories**:
 - Understanding and Memory,
 - Sustained Concentration and Persistence,
 - Social Interaction, and
 - Adaptation
 - c. **To the right of each of the items** is a series of **decision checkblocks** under the headings:
 - Not Significantly Limited
 - Moderately Limited
 - Markedly Limited
 - No Evidence of Limitation in This Category, and
 - Not Ratable on Available Evidence

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3. SECTION II

Section II – Remarks provides for discussion of evidence needed to rate particular items in section I.

4. SECTION III

- a. **Section III—Functional Capacity Assessment** is for recording the mental RFC determination. It is in this section that the **actual mental RFC assessment is recorded**, explaining the conclusions indicated in section I, in terms of the extent to which these mental capacities or functions could or could not be performed in work settings.
- b. The **discussion** of all mental capacities and limitations in this section **must be in narrative format**.

The MC must also include any other information that he/she believes is necessary to present a complete picture of mental RFC.
- c. The **Narrative must not** present estimates of capacities for mental functions that **could not be rated** because of insufficient evidence. Such would represent speculation.
- d. The completed SSA-4734-F4-SUP must be signed by the MC who conducted the analysis and prepared the mental RFC assessment.

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DI 24510.061 Summary Conclusions and Narrative Statement of Mental RFC

A. Introduction

To assure a comprehensive assessment of mental RFC, the SSA-4734-F4-SUP requires the MC **first** to record preliminary conclusions about the effect of the impairment(s) on **each** of **four** general areas of mental function (described in B.1-4 below), **then** to prepare a narrative statement of mental RFC.

B. Operating Policy

The MC is to **analyze each** of the **mental activities** within the following four general mental functional areas and to indicate on the SSA-4734-F4-SUP:

- **Whether** the **evidence** is **sufficient** to permit assessment or, if not, the evidence needed.
- The **extent** to which the individual **can** still **perform** and **sustain** specific mental activities and mental functions.

1. UNDERSTANDING AND MEMORY

- a. **Understanding and memory** can be evaluated through evidence from the mental status examination(s) or from elements of standardized psychological tests (such as IQ tests) that assess the ability to understand and remember, as well as evidence available from other medical and nonmedical sources, e.g., reports of prior work attempts or work evaluations.
- b. The ability to understand and remember may be at least partially assessed through answers to some of the following questions:
 - Is the individual able to complete forms, respond to two or three-step instructions for filling out applications, or follow instructions given by someone?
 - Did the individual have difficulty in the process of filing for disability, going for examinations, or remembering appointments?
 - Is there any **history of work or school failures** due to inability to remember and understand?
 - Was the individual involved in **special education** or **training programs**? (These might indicate some impairment of the ability to understand and remember.)
 - Is there any evidence that the claimant **requires supervision or assistance** to perform activities of daily living because of problems with understanding or remembering?

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- Did the individual **come to appointments without supervision**, finding his/her own way without unusual supervision?

2. SUSTAINED CONCENTRATION AND PERSISTENCE

- a. The individual's ability to sustain ongoing mental performance for a full workday is essential. **These may be evaluated through:**
 - Medical history and reports, and
 - Reports of performance at past work, recent work attempts, recreational or volunteer activities, or vocational evaluations.
- b. **Limitations** in these areas may be **demonstrated** in typically **less demanding settings**, such as sheltered work, vocational training, or school (i.e., in any situation demanding performance of tasks requiring concentration or task persistence).
- c. **Use care in inferring** an individual's **ability to sustain** the mental demands of work in a competitive setting from his/her performance in a less demanding setting, such as sheltered work.

NOTE: Discussion with the disability examiner of the performance required in competitive work environments may clarify this distinction.

3. SOCIAL INTERACTION

The items in this subsection deal with socially acceptable behavior and the individual's capacity to relate to others in a work setting. To assess these factors, important considerations are:

- Historical information about interpersonal interactions with others, particularly in an employment or work-like setting.
- Indications, on mental status examinations or psychological testing, of withdrawal, bizarre or unusual behavior, emotional lability, paranoid ideas, or faulty insight and judgment.
- Observed behavior, in terms of how the individual relates to various interviewers or behaves when exposed to a stressful circumstance or situation.

4. ADAPTATION

Adaptive functions reflect the individual's ability to integrate other areas of functioning.

- a. **The items in this section pertain to the individual's ability to:**
 - plan,
 - respond to changes,

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- deal appropriately with mental demands (stress),
 - avoid hazards and maintain safe behavior,
 - follow rules,
 - adhere to schedules and to time constraints, and
 - travel.
- b. **The area of mental demands of work** (“stress”) is difficult to assess. Some mentally impaired individuals may be unusually sensitive to changes in their environment and may become anxious, depressed, confused, or even psychotic when confronted with seemingly slight mental demands.

“Stress” is a highly individualized phenomenon and can only be assessed with regard to **each individual's experiences and limitations**. Even work activities usually considered to entail low stress may produce adverse responses in some individuals.

- c. **Data in the medical file may demonstrate sensitivity to change**, e.g., resistance to try a new activity, treatment or medication, or exacerbation of symptoms when a therapist leaves, changes schedule, or goes on vacation.
- d. Most health care settings have rules, schedules, and hazards. Limitations in conforming to acceptable behavior may sometimes emerge in the reports from hospital, or clinics.

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DI 24510.063 Completion of Section I of SSA-4734-F4-SUP

A. Operating Policy

For each of the items under the four headings, A through D, **one** of the five boxes to the right of each item **must** be checked.

B. Operating Procedure

Complete Section I by checking the appropriate boxes.

1. CHECK BOX 1

“**Not Significantly Limited,**” when the effects of the mental disorder **do not prevent** the individual from consistently and usefully performing the activity.

2. CHECK BOX 2

“**Moderately Limited,**” when the evidence supports the conclusion that the individual's **capacity to perform** the activity is **impaired**.

NOTE: The **degree and extent** of the capacity or **limitation** must be described in narrative format in Section III.

3. CHECK BOX 3

“**Markedly Limited,**” when the evidence supports the conclusion that the individual cannot usefully perform or sustain the activity.

4. CHECK BOX 4

When there is **no allegation of limitation** of this activity, or the **medical evidence does not indicate limitations** in a particular area and no limitation would be expected, based on the nature of the illness and the rater's clinical experience.

5. CHECK BOX 5

When there is **insufficient evidence** and either a problem in this aspect of work function has been alleged, the evidence suggests a problem, or the MC's clinical judgment suggests the likelihood of a problem.

NOTE: Absence of a rating (i.e., checking blocks 1, 2, or 3) for one or more items in a subsection in section I **does not automatically preclude** a narrative RFC statement for that subsection. **Other items** in the subsection **may be ratable** and may indicate such a level of functional loss that the disability examiner can conclude that the individual's capacity for work is severely compromised, in spite of the absence of a rating for other items.

Discussion with the disability examiner will resolve whether additional information about a subsection is necessary for a useful assessment of mental RFC.

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DI 24510.064 Completion of Section II of SSA-4734-F4-SUP - Remarks

A. Introduction

This section is for the identification of any **deficiencies** of evidence, the **type of evidence** needed, and any recommendations of the **source(s)** from which the evidence is to be obtained.

B. Operating Procedure

1. BOX 5 IS CHECKED

- a. **When box 5 is checked** for several items within a subsection, **consider** the **possibility** that the **record is inadequate** to permit an RFC statement for that subsection.
- b. **When this is the case, do not write a functional assessment** for that subsection in section III. Instead, **write a rationale in section II**, explaining why the narrative assessment is missing for that subsection.

2. ADDITIONAL MEDICAL DEVELOPMENT

- a. **Current evidence is insufficient.**

When the evidence in file is insufficient to permit the MC to make assessments of critical mental functional capacities, the MC will **record the medical development to be undertaken** in section II of the SSA-4734-F4-SUP.

NOTE: In addition to permitting new judgments on items that were not initially ratable, the **new evidence may cause the MC to reconsider judgments on other items.**

- b. **Additional evidence Obtained.**
 - o When **additional medical evidence is obtained**, a **new SSA-4734-F4-SUP must be prepared** to replace the preliminary SSA-4734-F4-SUP.
 - o **The new, signed SSA-4734-F4-SUP** is to be **filed on the left** side of the folder.
 - o **Clearly mark** the preliminary SSA-4734-F4-SUP "PRELIMINARY ONLY" on the first page, then **file** on the **right** side of the folder.
 - o **Do not file** preliminary SSA-4734-F4-SUP's on the **left** side of the folder.

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DI 24510.065 Section III of SSA-4734-F4-SUP - Functional Capacity Assessment

A. INTRODUCTION

Section III is for recording the formal narrative mental RFC assessment and **provides** for the MC to prepare a **narrative statement** for **each** of the subsections (A through D) in section I.

B. OPERATING PROCEDURE

In preparing the formal narrative statement, the MC is to address each of the four mental categories (Understanding and Memory, Concentration and Persistence, Social Interaction, and Adaptation) by:

- Identifying each mental category in turn; and
- Providing a narrative discussion of the individual's capacities and limitations.

1. Writing the Narrative Statement

- a. **Identify** the subsection (e.g., Understanding and Memory), then **discuss** the **functions** that the individual has demonstrated that he/she **can do**, as well as any **limitations** of those functions.
 - **Describe**, in detail, the mental capacities, limitations, and any other information that is important in the comprehensive expression of mental RFC.
 - **Indicate** the extent to which the individual could be **expected to perform and sustain** the activity.
 - **Include** any additional information or consideration that is necessary to give a **clear description** of the individual's mental functional capacity.

Examples:

- The claimant can understand, remember, and carry out a two-step command involving simple instructions.
 - The claimant can understand complex instructions but can only recall at a span of two-step commands. The claimant, therefore, would be limited to this span.
 - The claimant can understand and remember a four-step command, but the disruption of executive functions is such that he can carry out only a single step before confusing the order.
- b. **Record conclusions of functional capacity** provided by examining physicians that are **appropriate** and **consistent** with the documented medical and

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nonmedical evidence, along with the supporting findings. (See DI 24510.030C(III).)

- c. **Confine** discussion to the **effects** of the impairment(s) on function.
- d. **Include no severity ratings** or **nonspecific** qualifying **terms** (e.g., moderate, moderately severe) to describe limitations. Such terms do not describe function and do not usefully convey the extent of capacity limitation.
- e. **Offer no opinion** as to whether the individual is **disabled** or whether the individual **can** or might perform or **qualify** for **levels** of work (e.g., unskilled) or **specific jobs** (e.g., truck driver).

2. Signature and Date

- a. **After completing** the narrative statement in section III, sign and date the SSA-4734-F4-SUP in the spaces provided.
- b. The MC's name is to be typed or stamped below the signature.

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Appendix C – 9

Mental Cognitive Roundtable –
Mental Residual Functional Capacity Assessment Form

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FORM APPROVED
OMB No. 0960-0431

MENTAL RESIDUAL FUNCTIONAL CAPACITY ASSESSMENT

NAME	SOCIAL SECURITY NUMBER - -
CATEGORIES (From 1C of the PRTF)	ASSESSMENT IS FOR: <input type="checkbox"/> Current Evaluation <input type="checkbox"/> 12 Months After Onset: <input type="checkbox"/> Date Last Insured: _____ (Date) _____ (Date) <input type="checkbox"/> Other: _____ (Date) to _____ (Date)

I. SUMMARY CONCLUSIONS

This section is for recording summary conclusions derived from the evidence in file. Each mental activity is to be evaluated within the context of the individual's capacity to sustain that activity over a normal workday and workweek, on an ongoing basis. Detailed explanation of the degree of limitation for each category (A through D), as well as any other assessment information you deem appropriate, is to be recorded in Section III (Functional Capacity Assessment).

If rating category 5 is checked for any of the following items, you **MUST** specify in Section II the evidence that is needed to make the assessment. If you conclude that the record is so inadequately documented that no accurate functional capacity assessment can be made, indicate in Section II what development is necessary, but **DO NOT COMPLETE SECTION III**.

	Not Significantly Limited	Moderately Limited	Markedly Limited	No Evidence of Limitation in this Category	Not Ratable on Available Evidence
A. UNDERSTANDING AND MEMORY					
1. The ability to remember locations and work-like procedures.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
2. The ability to understand and remember very short and simple instructions.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
3. The ability to understand and remember detailed instructions.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
B. SUSTAINED CONCENTRATION AND PERSISTENCE					
4. The ability to carry out very short and simple instructions.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
5. The ability to carry out detailed instructions.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
6. The ability to maintain attention and concentration for extended periods.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
7. The ability to perform activities within a schedule, maintain regular attendance, and be punctual within customary tolerances.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
8. The ability to sustain an ordinary routine without special supervision.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
9. The ability to work in coordination with or proximity to others without being distracted by them.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
10. The ability to make simple work-related decisions.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

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	Not Significantly Limited	Moderately Limited	Markedly Limited	No Evidence of Limitation in this Category	Not Ratable on Available Evidence
Continued — <u>SUSTAINED CONCENTRATION AND PERSISTENCE</u>					
11. The ability to complete a normal work-day and workweek without interruptions from psychologically based symptoms and to perform at a consistent pace without an unreasonable number and length of rest periods.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
C. <u>SOCIAL INTERACTION</u>					
12. The ability to interact appropriately with the general public.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
13. The ability to ask simple questions or request assistance.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
14. The ability to accept instructions and respond appropriately to criticism from supervisors.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
15. The ability to get along with coworkers or peers without distracting them or exhibiting behavioral extremes.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
16. The ability to maintain socially appropriate behavior and to adhere to basic standards of neatness and cleanliness.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
D. <u>ADAPTATION</u>					
17. The ability to respond appropriately to changes in the work setting.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
18. The ability to be aware of normal hazards and take appropriate precautions.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
19. The ability to travel in unfamiliar places or use public transportation.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
20. The ability to set realistic goals or make plans independently of others.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

II. REMARKS: If you checked box 5 for any of the preceding items or if any other documentation deficiencies were identified, you **MUST** specify what additional documentation is needed. Cite the item number(s), as well as any other specific deficiency, and indicate the development to be undertaken.

Continued on Page 3

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Continued on Page 4

III. FUNCTIONAL CAPACITY ASSESSMENT

Record the elaborations on the preceding capacities in this section. Complete this section ONLY after the SUMMARY CONCLUSIONS section has been completed. Explain your summary conclusions in narrative form. Include any information which clarifies limitation or function. Be especially careful to explain conclusions that differ from those of treating medical sources or from the individual's allegations.

Continued on Page 4

THESE FINDINGS COMPLETE THE MEDICAL PORTION OF THE DISABILITY DETERMINATION.

MEDICAL CONSULTANT'S SIGNATURE

DATE:

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Continuation Sheet – Indicate section(s) being continued.

Privacy Act Notice: The information requested on this form is authorized by Section 223 and Section 1633 of the Social Security Act. The information provided will be used in making a decision on this claim. Failure to complete this form may result in a delay in processing the claim. Information furnished on this form may be disclosed by the Social Security Administration to another person or governmental agency only with respect to Social Security programs and to comply with federal laws requiring the exchange of information between Social Security and other agencies.

Paperwork Reduction Act: This information collection meets the requirements of 44 U.S.C. § 3507, as amended by Section 2 of the Paperwork Reduction Act of 1995. You do not need to answer these questions unless we display a valid Office of Management and Budget control number. We estimate that it will take about 20 minutes to read the instructions, gather the facts, and answer the questions. *You may send comments on our time estimate above to: SSA, 6401 Security Blvd., Baltimore, MD 21235-6401. Send only comments relating to our time estimate to this address, not the completed form.*

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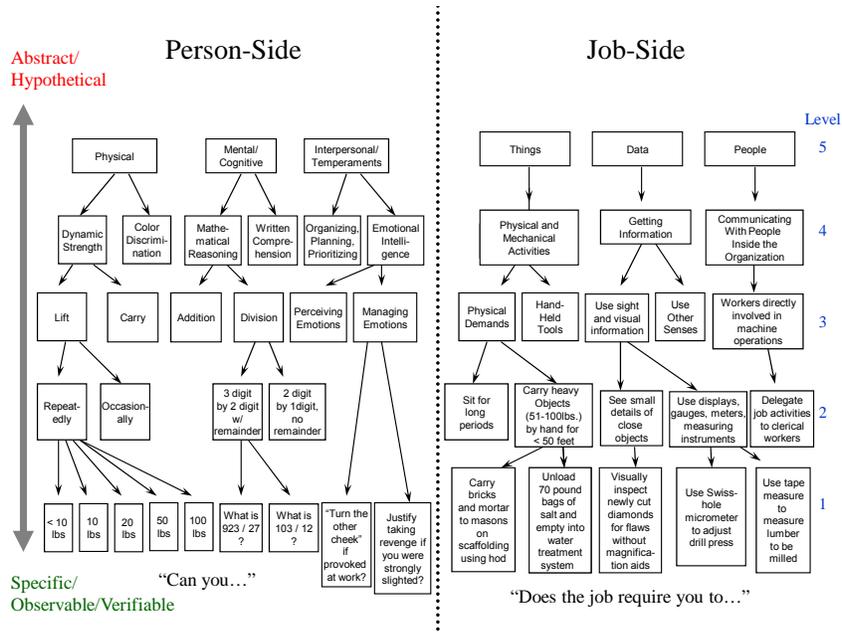
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Appendix D

First Mental Cognitive Subcommittee Presentation

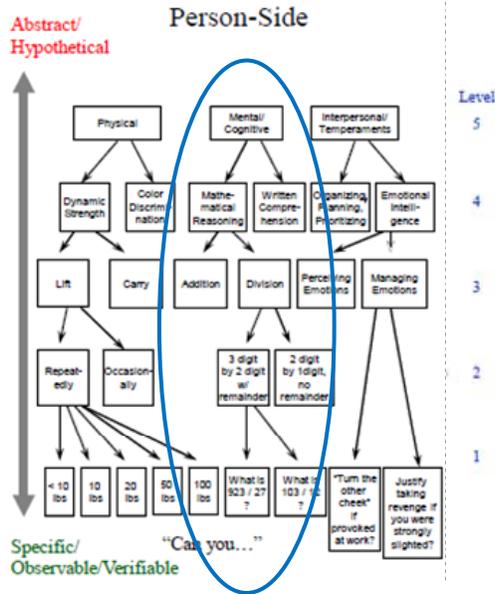
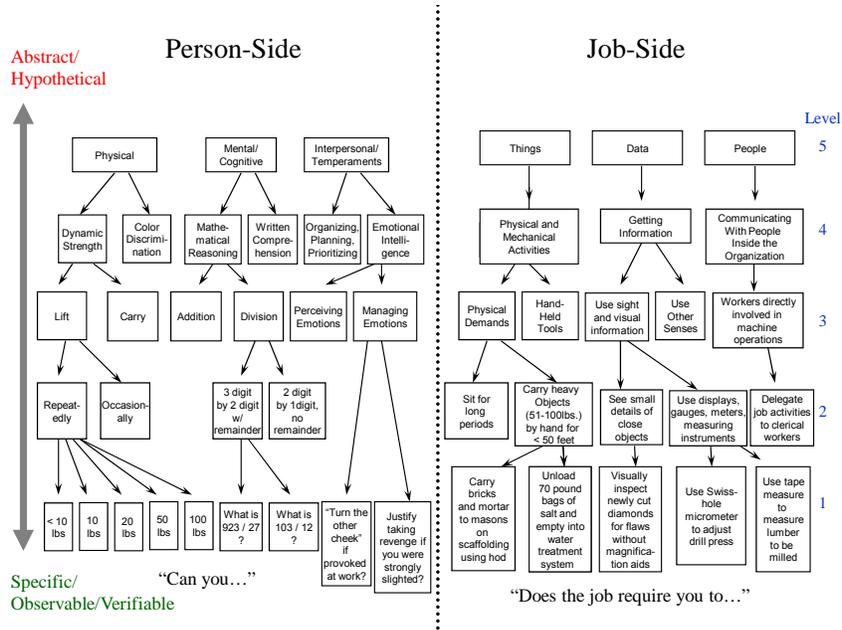
Cognitive Assessment for the Determination of Mental Residual Functional Capacity

David J. Schretlen, PhD
OIDAP Meeting
April 29, 2009



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Mental/Cognitive

- Individual differences in cognitive test performance predict occupational attainment in healthy and clinical populations
- Often predicts work outcome better than primary symptom severity (eg, TBI, MS, Schizophrenia, etc.)
- This makes cognitive function a “final common pathway” of work disability in many diseases and conditions
- Thus, it is essential to include cognition in mental RFC
- Two ways to approach this
 - Performance-based measures (IQ, memory, attention testing)
 - Ratings (self- or informant-repot)

We must first decide what
abilities to assess before we
decide how to assess them

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Clinical approach: A view from the
the perspective of what goes wrong

Domain affected	Disease/condition	Manifestation
Intelligence	Fragile X	Intellectual disability
Language	Stroke	Aphasia
Attention	Traumatic brain injury	Distractibility/ADD
Learning/memory	Korsakoff	Amnesia
Processing speed	Parkinson	Bradyphrenia/bradykinesia
Visual-spatial abilities	Lewy body	Agnosia
Executive functioning	Schizophrenia	Dysexecutive & abulia
Arithmetical abilities	Developmental	Acalculia
Skilled movement	Brain tumor	Apraxia
Wakefulness	Narcolepsy	Drowsiness

Psychometric approach: A view from the
perspective of factor analyses

- EFA (exploratory factor analysis) is used to elucidate an underlying factor structure
- CFA (confirmatory factor analysis) is used to test *a priori* hypotheses
 - Based on a conceptual model or previous findings
 - Evaluate a model and compare it to specific alternatives
 - Test how well hypothesized models fit the observed data
 - Compare “nested” models (in which some models combine factors from preceding ones)

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FACTOR ANALYSES	CFA: Confirmatory Factor Analysis, EFA: Exploratory factor analysis, BCPA: block principal component analysis, RCA: Reliable Components Analysis, PCA: Prin Components Analysis; SCFA: Single Confirmatory Factor Analysis, PAF: Prin Axis Factoring			
HEALTHY SAMPLES	Sample / Tests in Domain	Analysis #	Vars	# Factors
Gomez et al., 2006	521 Spanish-speaking Normal Control	EFA	27	6
1. Attentional-executive	category formation test, visual search, semantic verbal fluency, phonological verbal fluency, design fluency			
2. Contextual-exec memory	LMI, LMD, Verbal paired associates immediate, & Delayed, motor functions			
3. Verbal memory	word list encoding, free recall, cued recall, recognition			
4. Sustained attention	time orientation, digit detection, mental control, faces immediate, faces delayed recall			
5. Atten - working memory	digit span forward, & backward, spatial span forward, & backward			
6. Orientation	place orientation, person orientation			
Tulsky et al., 2003	1,250 Normal Control (healthy adults aged 16 - 89)	CFA	26	6
1. Verbal comprehension	Vocabulary, Information, Similarities, Comprehension (Verbal Comp of WAIS-III)			
2. Perceptual organization	Matrix Reasoning, Block Design, Picture Completion (WAIS-III) Picture Arrangement (WMS-III)			
3. Auditory memory	Logical Mem I, Logical Mem II, Verbal Paired I, Verbal Paired II, Word List I, Word List II			
4. Visual memory	Faces I, Faces II, Family Picture I, Family Pictures II, Visual Reproduction I, Visual Reproduction II			
5. Working memory	Letter Number Sequencing, Digit Span, Arithmetic, Spatial Span			
6. Processing speed	Symbol Search, Digit Symbol			
Rowe et al., 2007	1,316 Normal Controls (mean age = 33, range 6-16)	PCA	19	7
1. Info processing & speed	Verbal Interference Test Part I, and II, Switching of Attention Test Parts I, and II, Choice Reaction Time test			
2. Verbal memory	Verbal Learning and Recall Test: delayed, recognition, immediate recall			
3. Vigilance/sustained atten	CPT Reaction Time, CPT Errors			
4. Working memory	Digit Span forward, Digit Span backward, Span of Visual Memory Test			
5. Sensori-motor function	average pause between taps on tapping test for dominant and non-dominant hands			
6. Verbal processing	Letter Fluency, Category Fluency			
7. Executive function	Maze completion time, Maze overrun errors, Span of Visual Memory Test			
Salthouse, 1998	Three healthy groups: children (age 5-17) n = 3,155 ; college students (age 18-22) n = 735; nonstudents (age 18-94) n = 1580			
1. General higher-order factor	concept formation, calculation, app probs, science, social studies, humanities, incomplete words, visual closure, sound blending, memory for names, Visual-Auditory learning, memory for sentences, memory for words, visual matching, cross out	SCFA	16	1
Colom et al., 2009				
1. g (General Intelligence)	Adv Progressive Matrices (APM), Induct reason (PMA-R), abs reason (DAT-AR), vocab (PMA-V), verbal reason (DAT-VR)			

1. Gf (fluid intelligence)	Advanced Progressive Matrices (APM), Inductive reasoning subtest (PMA-R), abstract reasoning (DAT-AR)			
2. Gc (crystallized intelligence)	vocabulary (PMA-V), verbal reasoning (DAT-VR), numerical reasoning (DAT-NR)			
3. Gv (verbal intelligence)	Solid Figures, mental rotation (PMA-S), spatial relations (DAT-SR)			
Visser et al., 2006	200 Normal Controls (age range = 17-66, M = 22.7 (6.1))			
1. g (General intelligence)	Nec Arith Operations, Diagramming Relationships, Opposites, Paper Folding, Social Translations, Vocab, Map Planning, Subtraction and Multiplication, Consistency, Cartoon Predictions, Stork Stand, Mark Making, Tonal Accuracy	PAF	15	1
MIXED/MULTIPLE GRPS				
Dickinson et al., 2004	97 Schizophrenia & 87 Normal Controls			
1. Common Factor	Vocab, Sim, Info, PC, BD, MR, LNS, Spatial Span, DSym, Sym Search, LM I, LM II, VP I, VP II, Fac Rec I, II, Family Pict I, II	SCFA	18	1
Dickinson et al., 2006	157 Normal Control 148 Schizophrenia	CFA CFA	17 17	6 6
1. Verbal comprehension	Vocab (WAIS-R), Visual Naming (MAE)			
2. Perceptual organization	Block Design (WAIS-R), Line Orientation (Benton)			
3. Verbal learning/memory	Trials 1-5 & Delayed Free Recall (CVLT), Logical Mem immediate & delayed (WMS-R)			
4. Visual learning/memory	Figural Memory immediate & delayed (WMS-R)			
5. Info processing speed	Symbol Cancellation Test, Tris A, Animal Naming (BDAE)			
6. Exec/Working memory	Digit Span (WAIS-R), Tris B, Categories & Persev. Erras (WCST)			
Genderson et al., 2007	125 NC (-5 due to kurtosis) 162 probands (-5 due to kurtosis) 94 SZ (-5 due to kurtosis) 382 full sample (-15 due to kurtosis)	CFA* CFA* CFA* CFA*	21 21 21 21	7 7 7 7
1. Speed	Tris A, Tris B, Let. Fluency, Cat. Fluency			
2. Target detection	CPT distraction, CPT vigilance, Zero-back			
3. N back updating/ exec	One Back, Two Back, Three Back			
4. Verbal episodic memory	CVLT Trails 1-5, WM Log Memory, WM Pair Assoc I, Pair Assoc II			
5. Visual processing/memory	WM Visual Reprod I, Visual Reprod II, Benton Line,			
6. WCST executive function	WCST Persev Errors, WCST Categories			
7. Digit span	WMSR Forward, WMSR Backward			

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Gladso et al., 2004				
	209 Psychotic Disorder	CFA	21	6
	131 Normal Control	CFA	21	6
1. Verbal crystallized	WAIS-R Vocab, Info, Similarities; Boston Naming			
2. Attention/working mem	WAIS-R Arith, Digit Span			
3. Verbal episodic	CVLT Monday Total, Story Learning, CVLT Long-Deay Free Recall			
4. Speed of info processing	WAIS-R Digit Symbol, Tris A, Tris B, GPB, Digit Vigilance, Let. Fluency			
5. Visual episodic	Figure Learning, Figure Delay			
6. Reasoning/problem solving	Block Design, Category, WCST			
Johnson et al., 2009				
	191 Normal Controls (mean age = 75)	CFA	12	4
	115 autopsy confirmed AD (mean age = 80)	CFA	12	4
1. General (all measures)	** all of the tests are included in this factor			
2. Verbal memory	Information, Paired Associates Learning, BNT, Logical Memory			
3. Visuospatial	BVRT (Benton Visual Rec. Test), Digit Symbol, Tris A, Block Design			
4. Working memory	Word Fluency, Mental Control, Digit Span Backward, Digit Span Forward			
Schretlen et al., 2009				
	340 Normal Control	CFA	15	6
	126 Bipolar Disorder	CFA	15	6
	110 Schizophrenia	CFA	15	6
1. Attention	BTA-L, BTA-N, CPT-II			
2. Speed	TMT-A, TMT-B, GPT			
3. Fluency	Letter, Category, Design			
4. Visual memory	BVMT 1-3, BVMT Del			
5. Verbal memory	HVLT 1-3, HVLT Del			
6. Executive function	WCST Cat, WCST Err			
Siedlecki et al., 2008				
	322 Normal Control	CFA	15	5
	878 Questionable Dementia	CFA	15	5
	639 Alzheimer Disease	CFA	15	5

1. Processing speed	Shape Time (shapes) and TMX Time (letters) of Cancellation Task			
2. Memory	SRT (Selective Reminding Task) Total Recall, Delayed Recall, Delayed Recog, BVRT (Benton Visual) Recog			
3. Language	Naming (BNT), Repetition, Comprehension, Letter Fluency, Category Fluency			
4. Reasoning visual/spatial	WAIS Similarities, Identities/Oddities (MDRS), Rosen (drawing test), BVRT Matching (Benton Visual)			
5. Attention	TMX Omits (Letters)& Shape Omits of Cancellation Test,			
CLINICAL SAMPLES				
Frazier et al., 2004				
	1,364 mixed patient sample	RCA	21	4
1. Memory	WMS-III Auditory Immediate, Visual Immediate, Auditory Delayed, Visual Delayed, Auditory Recognition			
2. Visual motor	Tris A, Tris B, WAIS-III PSI, WAIS-III POI, Finger Tapping Dominant, Finger Tapping Non-Dominant, GBP Dom, GPB Ndom			
3. Language	WAIS-III VCI, WAIS-III POI, WRAT-3 Reading, BNT, Verbal Fluency			
4. Executive	WCST Perseverative Errors, WCST Categories			
Fris et al., 2002				
	219 Schizophrenia	EFA	17	5
1. Working memory	Controlled Oral Word Association Task (COWA), Digit Span w/distractor, Digit Span w/out distractor (Digit Span Distractability Test), CPT hits			
2. Executive function	WCST Categories, WCST Perseverative Responses, WCST # attempts to first category			
3. Verbal learning	CVLT immediate recall, CVLT delayed free recall, CVLT errors			
4. Impulsivity	CPT false alarms (comissions), CPT Reation Time			
5. Motor speed	Finger Tapping			
Jaeger et al., 2003				
	156 Schizophrenia	BPCA	44	6
1. Attention	Concen Endurance (Letters -Errors), Stroop-Words, Stroop-Colors, Tris A, WMS-R Visual Mem, WAIS-R Digit Symbol			
2. Working memory	Concentration Endurance Test (Fluctuation), WAIS-R DS Forward, Letter Number Span # Correct, Longest, WAIS-R Arith, WAIS-R DS Backward, LMI			
3. Ideational fluency + WCST persev.	Ruff Fugural Fluency- Unique Designs, COWAT, Animal Naming, WCST Per Errors			
4. Learning	WMS-R LM I, LM II, WMS-R Verbal Paired I, Verbal Paired II, WMS-R VR I, VR II, WMS-R Visual Paired I, Visual Paired II			
5. Verbal knowledge	WAIS-R Vocab, Info, Comp, Similarities			
6. Non-Verbal function	WMS-R VR I, VR II, WAIS-R Block Design, Object Assembly, Pict Comp, Pict Arrangement			

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Czobor et al., 2007				
	185 Schizophrenia, 65 Schizoaffective	EFA	29	6
	155 Bipolar Disorder	EFA, CFA	29	6
1. Attention	Concentration Endurance Test (Letters-Errors), Stroop-Words, Stroop-Colors, Tris A, WAIS-R Digit Symbol			
2. Working memory	Concen Endurance (Fluctuation), WMS-R DS Forward, Letter Number Span, WAIS-R Arith, WAIS-R DS Backward, LMI			
3. Ideational fluency + WCST persev.	Ruff Fugural Fluency- Unique Designs, COWAT, Animal Naming			
4. Learning	WMS-R Verbal Paired I, Verbal Paired II, WMS-R Visual Paired I, Visual Paired II			
5. Verbal knowledge	WAIS-R Vocab, Info, Comp, Similarities			
6. Non-Verbal function	WAIS-R Block Design, Pict Comp, Pict Arrangement			
Keefe et al., 2006				
	1,493 Schizophrenia (includes medical and substance abuse comorbidities)	PCA	24	5
1. Processing speed	COWAT, Category instance, GPB, WAIS-R Digit Symbol			
2. Reasoning	WCST (Perseverative errors & categories)			
3. Verbal memory	HVLT (total recall)			
4. Working memory	Computerized test of visuospatial working memory, letter-number sequencing (# correct)			
5. Vigilance	CPT (d-prime)			
Williams et al., 2008				
	*verified factor structure found in Rowe et al. (2007)			
	56 First Episode Schizophrenia (mean age = 20)	PCA	19	7
1. Information processing & speed	Verbal Interference Test Part I, and II, Switching of Attention Test Parts I, and II, Choice Reaction Time test			
2. Verbal memory	Verbal Learning and Recall Test: delayed, recognition, immediate recall			
3. Vigilance/sustained attention	CPT Reaction Time, CPT Errors			
4. Working memory capacity	Digit Span forward, Digit Span backward, Span of Visual Memory Test			
5. Sensori-motor function	average pause between taps on tapping test for dominant and non-dominant hands			
6. Verbal processing	Letter Fluency, Category Fluency			
7. Executive function	Maze completion time, Maze overrun errors, Span of Visual Memory Test			

General Findings

- Several models of latent cognitive structure have found empirical support in one or more population
 - A few have been replicated in multiple samples
 - And a few have been confirmed by CFA
- The measures included in an assessment strongly affect the nature of the latent cognitive model that is found
- Three “levels” of model complexity deserve particular attention
 - Single factor model: General cognitive ability (*g*)
 - Two-factor models: Crystallized and fluid abilities (*Gc* & *Gf*)
 - Multiple-factor models: Multiple cognitive domains

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Lumping vs. splitting

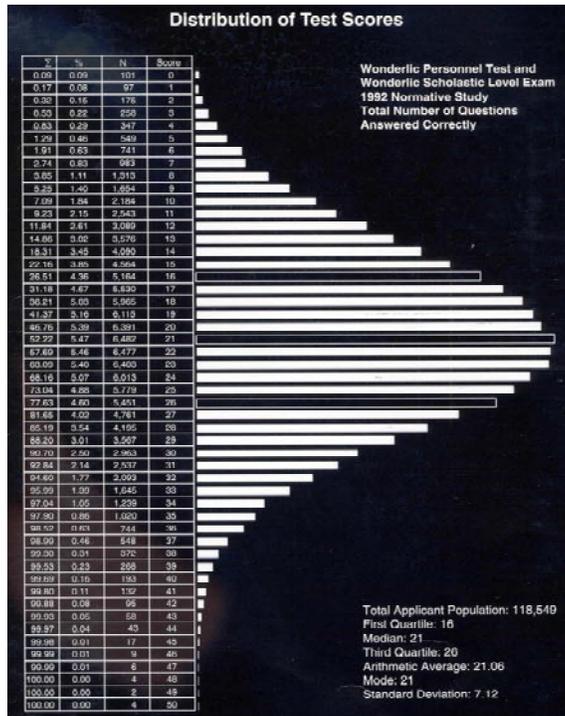
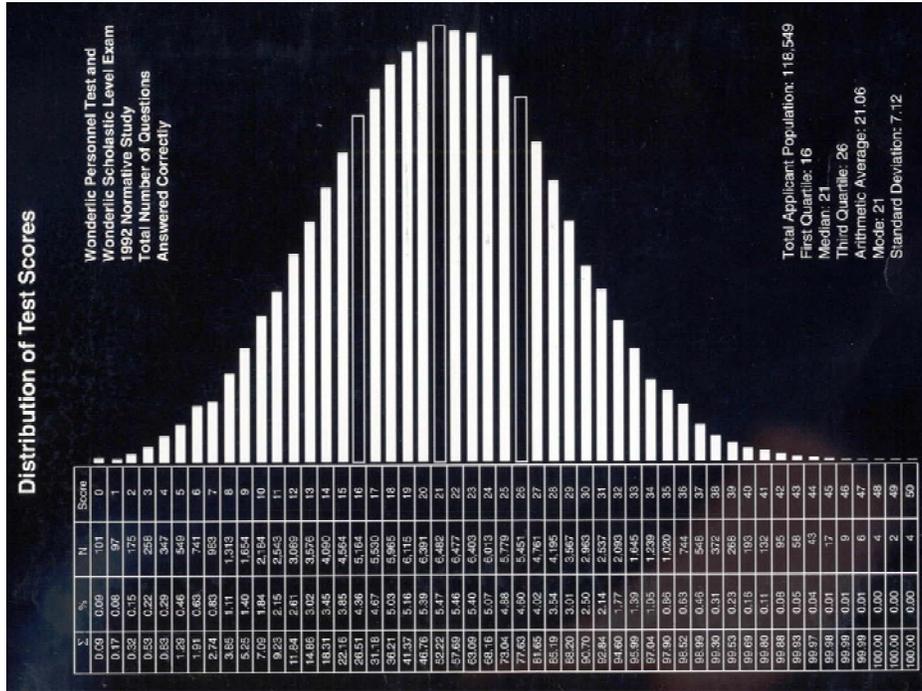
- A single summary measure of impairment or cognitive RFC ability has advantages
 - It is easily understood
 - More reliably measured than specific cognitive domains
 - Separate factors share common variance anyway
 - Summary measures correlate best with most outcomes
- Multiple factors have advantages too
 - No theoretical cognitive construct maps onto a summary impairment index
 - Summary scores might mask specific impairments or aspects of RFC that preclude or support employability
 - Scores for multiple measures are no harder to understand than a single summary score

One-Factor Model: *g*

- Hundreds of studies document the existence of a single general mental ability, *g*, on which individuals differ
- *g* is a construct
 - That is not directly observable
 - Determined by genetic and environmental factors
- Arises from fact that performances on all cognitive tasks are positively correlated
 - All cognitive tests measure *g* (to varying degrees)
 - Thus, *g* is not tied to any specific test content such as words, numbers, or geometric patterns
 - Nor is *g* bound to any sex, age, or cultural group
- The *g* component of tests accounts for most of their predictive power

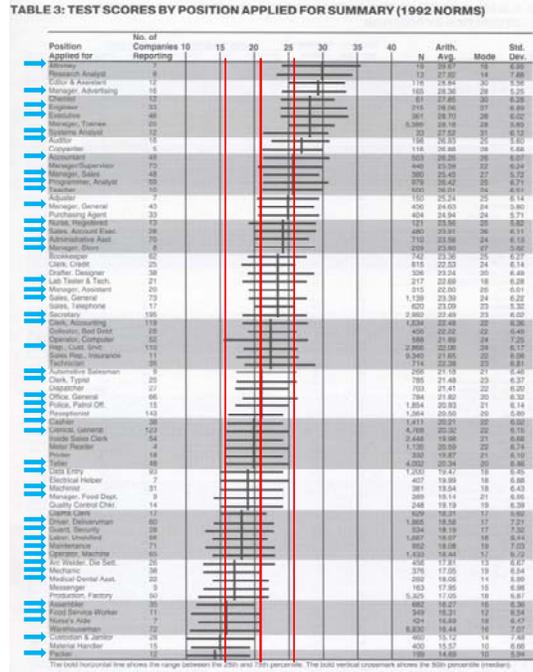
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Some Implications & Questions

TABLE 3: TEST SCORES BY POSITION APPLIED FOR SUMMARY (1992 NORMS)

- 25% of workers fall below 1st quartile
- What point in the distribution of incumbents' scores defines insufficient RFC to meet job demands?
 - 25th %ile, 2nd %ile
- How “well” must a disability applicant be able to perform a job in order to be not disabled?
 - Poor employees are the first laid off
 - Job placement vs. job maintenance
- What is “fair” to non-disabled workers?

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Comment

- The single-factor g model has advantages
 - It is parsimonious
 - g is well documented and highly defensible
 - We can measure it reliably in many languages
 - Individual differences in g are robust, easily assessed, and strongly predictive of occupational attainment, work performance, and income in normal, healthy persons
 - We can obtain a reasonable estimate of g in a few minutes, using such instruments as the Wonderlic Personnel Test
- It also has limitations
 - Lacks sensitivity to many types of brain dysfunction
 - Does not capture more circumscribed cognitive deficits
 - Thus, might not measure residual functional capacity very well

Two-Factor Model

- Many studies distinguish between highly over-learned skills or knowledge (Crystallized abilities or G_c) and current, online information processing (Fluid abilities or G_f)
 - G_c : vocabulary, fund of information, mathematical ability
 - G_f : novel problem solving, reasoning, speed of processing
 - G_c grows rapidly in childhood, and more slowly in adulthood, and then declines in very late life
 - G_f grows rapidly in childhood, peaks around age 20, and then declines throughout adulthood
 - G_c is more affected than G_f by education
 - G_f is more sensitive than G_c to brain dysfunction

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Application of a
Two-Factor Model

MENTAL STATUS EXAMINATION—TELEPHONE VERSION
David J. Schretlen, PhD

Name _____ (Phone) _____ Date ____/____/____ Age ____ Sex ____

Test Item & Instructions	Scoring Criteria	Score
1. What is today's date? (Prompt for each part as needed.)	____ Day ____ Date ____ Month ____ Year Score 1 point for each correct part of date.	____/4
2. Next I am going to read a list of nine words. Please listen carefully. When I am done, tell me as many words as you can remember in any order. Ready? (Recite each word only once)	____ dentist ____ pepper ____ shoes ____ mustard ____ waitress ____ pants ____ teacher ____ hat ____ vanilla Score 1 point for each word recalled.	____/9
3. Now I am going to read the same list of nine words. After I am through, tell me as many words as you can remember, including words you said the first time. Ready?	____ dentist ____ pepper ____ shoes ____ mustard ____ waitress ____ pants ____ teacher ____ hat ____ vanilla Score 1 point for each word recalled.	____/9
4. How much is 100 minus 7? And how much is 7 from that? And 7 from that? Keep going. (Do not correct errors, but allow subject to subtract from each prior response)	____ 93 ____ 85 ____ 79 ____ 72 ____ 65 ____ Write subject's response after each subtraction and score 1 point for each correct difference (e.g., "93-85=77-70=64" would receive a score of 2).	____/5
5. The opposite of up is down. What is the opposite of <i>up</i> ? What is the opposite of <i>shallow</i> ? And the opposite of <i>remain</i> ? And the opposite of <i>reldom</i> ? And the opposite of <i>learn</i> ? Score 1 point for each correct answer.	____ full or fill ____ deep (not clear, dark, full or wide) ____ depart, leave, go, move or change (not stay) ____ often or frequently (not always) ____ forget or teach (not dumb, fail, or ignore)	____/5
6. How much does 5 + 6 equal? How much does 17 - 9 equal? How much does 4 x 16 equal? How much does 70 ÷ 5 equal? Score 1 point for each correct answer.	____ 11 ____ 8 ____ 64 ____ 14	____/4
7. How many months are there in a year? Who was the first President of the United States? On what continent is the Sahara Desert? What kind of tree will grow from an acorn? How many square feet are in a square yard? Score 1 point for each correct answer.	____ 12 ____ George Washington (or Washington) ____ Africa (or African continent) ____ oak (or oak tree) ____ 9	____/5
8. A few minutes ago I read a list of nine words to you. Now I want you to tell me as many of the words on that list as you can remember. Score 1 point for each word recalled.	____ dentist ____ pepper ____ shoes ____ mustard ____ waitress ____ pants ____ teacher ____ hat ____ vanilla	____/9
Total correct: ____/50		

MSE-TV in SSDI/SSI Beneficiaries

Variable	ABC Full Sample (n = 234)	ABC Matched Sample (n = 139)	SSA Sample (n = 139)
Age (years)	54 ± 17	43 ± 13	41 ± 11
Sex (M:F%)	44:56	42:58	45:55
Race (W:B:O%)	79:18:2	68:29:3	26:64:5
Educ. (years)	14 ± 3	14 ± 3	N/A
MMSE	28 ± 2	28 ± 2	24 ± 4

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PCA with Varimax Rotation Factor Loadings for ABC and SSA Samples

Question	Factor 1 General Ability		Factor 2 Learning/Memory		Factor 3 Orientation	
	ABC	SSA	ABC	SSA	ABC	SSA
Orientation					.93	.99
Word recall (1)			.75	.84		
Word recall (2)			.83	.86		
Serial 7's	.77	.79				
Opposites	.68	.80				
Arithmetic	.60	.80				
Information	.73	.69				
Word recall (3)			.82	.78		

Correlations of MSE-TV Scores with Other Cognitive Measures

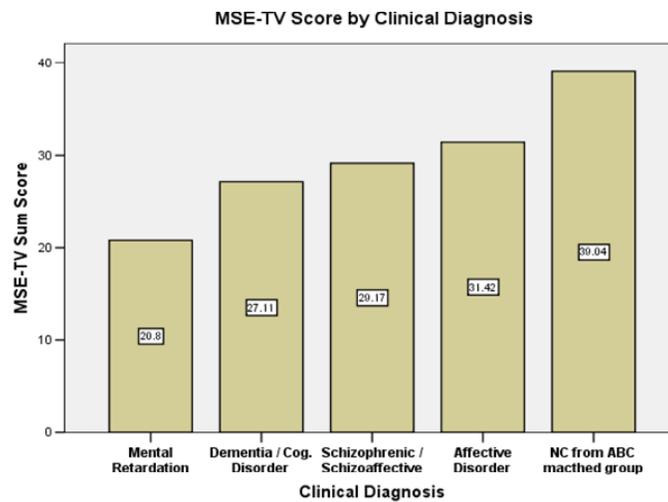
Variable	MSE-TV Total	MMSE Total	Factor 1 General Ability	Factor 2 Learning & Memory	Factor 3 Temporal Orientation
WAIS-R Sum SS	0.63**	0.53**	0.66**	0.42**	0.02
NART IQ	0.58**	0.37**	0.69**	0.32**	0.03
HVLT Learning	0.48**	0.30**	0.27**	0.50**	0.05
HVLT Delay	0.44**	0.27**	0.27**	0.45**	0.13
BVMT Learning	0.44**	0.33**	0.27**	0.40**	0.06
BVMT Delay	0.35**	0.33**	0.21**	0.40**	0.07

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Group Differences in MSE-TV Scores

MSE-TV Variable	Healthy Controls (N = 139)	Affective Disorder (N = 59)	Schizophrenia Spectrum (N = 36)	Cognitive Disorder (N = 18)	Mental Retardation (N = 20)
Total	39.0 ± 5.5 _a	31.4 ± 7.5 _b	29.2 ± 5.8 _b	27.1 ± 6.6 _b	20.8 ± 6.4 _c
Factor 1	14.5 ± 3.2 _a	10.9 ± 4.4 _b	10.8 ± 3.5 _b	8.9 ± 4.5 _b	4.7 ± 3.0 _c
Factor 2	20.6 ± 3.4 _a	16.5 ± 3.9 _b	14.5 ± 3.8 _b	14.2 ± 4.0 _b	12.2 ± 4.5 _c
Factor 3	3.9 ± 0.3	4.0 ± 0.0	3.9 ± 0.4	3.9 ± 0.2	4.0 ± 0.2



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Comment on Two-Factor Models

- Allow for slightly more fine-grained assessment of cognitive functioning and impairments
- Gc reflects over-learned “premorbid” verbal abilities that are relatively insensitive to aging and brain dysfunction
- Gf reflects current nonverbal problem solving abilities that are sensitive to age and brain dysfunction
- These two factors can be combined into one

Multiple-Factor Models

- Several multiple-factor models emerged from our (selective) review of the literature
- The most robust and well-replicated factors include
 - General mental ability (*g*)
 - Verbal learning and memory
 - Processing speed
- Somewhat less clear (in terms of independence)
 - Working memory
 - Attention/concentration
 - Executive functioning
 - Ideational fluency

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**Johns Hopkins Confirmatory Factor
 Analysis in Three Populations**

- Determine whether the same hypothesized latent factors would characterize cognitive functioning in three groups
- Test hypothesized model against specific alternatives
- Hypothesized model based on previous study (Schretlen et al, 2007)

Participants and Method

Recruited 576 participants, including 340 reasonably healthy adults (NC), 110 relatively stable individuals with schizophrenia (SZ), and 126 relatively stable persons with bipolar disorder (BD).

All participants underwent cognitive testing.

	NC (n = 340)	SZ (n=110)	BD (n=126)	Statistic	p
Age (years)	54 ± 19	40 ± 11	42 ± 11	$F_{(2,571)} = 44.1$	<.001
Sex (male, %)	44	70	40	$\chi^2_{(2)} = 28.2$	<.001
Race (w:b:o %)	79:18:3	39:55:6	55:40:5	$\chi^2_{(4)} = 68.9$	<.001
Education (years)	14 ± 3	12 ± 2	14 ± 3	$F_{(2,571)} = 19.5$	<.001
Est. premorbid IQ	105 ± 10	97 ± 11	103 ± 12	$F_{(2,571)} = 23.3$	<.001

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Clinical Characteristics of the Patients

	SZ (n=110)	BD (n=126)	Statistic	p
Age at onset , years	23 ± 7	25 ± 9	$t_{(212)} = -1.8$.064
Illness duration, years	17 ± 11	18 ± 11	$t_{(212)} = -0.6$	.519
# Hospitalizations	5.0 ± 5.6	3.7 ± 5.1	$t_{(210)} = 1.8$	.066
SANS (sum)	8.9 ± 5.5	1.8 ± 2.4	$t_{(193)} = 8.6$	.001
SAPS (sum)	4.7 ± 3.8	1.0 ± 1.8	$t_{(191)} = 11.9$	.001
Typical antipsychotic (%)	34	5	$\chi^2_{(1)} = 14.7$	.001
Atypical antipsychotic (%)	74	47	$\chi^2_{(1)} = 13.9$	.001
Antidepressant (%)	23	48	$\chi^2_{(1)} = 12.0$	.002
Lithium (%)	4	56	$\chi^2_{(1)} = 58.6$.001
Anticonvulsant (%)	12	44	$\chi^2_{(1)} = 23.7$.001

Competing Models

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Six-Factor Model

Factor	Measures
Psychomotor Speed	TMT-A, TMT-B, and GPT (mean of both hands)
Attention	BTA-L, BTA-N, and CPT Hit RTse
Ideational Fluency	Letter, Category, and Design Fluency
Verbal Memory	HVLT-R Learning and delayed recall
Visual Memory	BVMT-R Learning and delayed recall
Executive Function	mWCST category sorts and errors

Six-Factor Model with TMT-B on EF

Factors	Measures
Psychomotor Speed	TMT-A and GPT (mean of both hands)
Attention	BTA-L, BTA-N, and CPT Hit RTse
Ideational Fluency	Letter, Category, and Design Fluency
Verbal Memory	HVLT-R Learning and delayed recall
Visual Memory	BVMT-R Learning and delayed recall
Executive Function	TMT-B mWCST categories and errors

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Five-Factor “Speed” Model

Factors	Measures
Psychomotor Speed	TMT-A, TMT-B, GPT, Letter, Category, and Design
Attention	BTA-L, BTA-N and CPT Hit RTse
Verbal Memory	HVLT-R Learning and delayed recall
Visual Memory	BVMT-R Learning and delayed recall
Executive Function	mWCST category sorts and errors

Five-Factor “Memory” Model

Factors	Measures
Psychomotor Speed	TMT-A, TMT-B and GPT (mean of both hands)
Attention	BTA-L, BTA-N and CPT Hit RTse
Ideational Fluency	Letter, Category, and Design Fluency
Memory	HVLT-R and BVMT-R learning and delayed recall
Executive Function	Wcst categories and Wcst errors

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Four-Factor Model

Factors	Measures
Psychomotor Speed	TMT-A, TMT-B, GPT, Letter, Category, and Design
Attention	BTA-L, BTA-N and CPT Hit RTse
Memory	HVLT-R and BVMT-R learning and delayed recall
Executive Function	mWCST category sorts and errors

One-Factor Model

Factors	Measures
General Cognition	All measures

Evaluating CFA Results

Statistic	Name	Recommended Values
χ^2/df	Chi-square/df	< 3 is a good fit
RMSEA	Root mean square error of approximation	< 0.05 is a very good fit < 0.08 is a reasonable fit
NNFI	Non-normed fit index	> 0.95 is a close fit > 0.90 is a good fit
CFI	Comparative fit index	> 0.95 is a close fit > 0.90 is a good fit

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CFA Results: Six-Factor Models

		Group	χ^2/df	RMSEA	NNFI	CFI
Six-Factor Model	Combined	2.50	0.051	0.99	0.99	
	NC	1.79	0.048	0.98	0.99	
	BD	1.63	0.071	0.96	0.97	
	SZ	1.40	0.060	0.98	0.98	
Six-Factor Model with TMT-B in EF	Combined	4.92	0.083	0.95	0.96	
	NC	3.44	0.085	0.93	0.95	
	BD	1.93	0.087	0.94	0.95	
	SZ	2.03	0.097	0.92	0.94	

CFA Results: Five-Factor Models

		Group	χ^2/df	RMSEA	NNFI	CFI
Five-Factor “Speed” Model	Combined	4.75	0.081	0.96	0.97	
	NC	3.38	0.084	0.95	0.96	
	BD	1.82	0.081	0.95	0.96	
	SZ	1.54	0.071	0.96	0.97	
Five-Factor “Memory” Model	Combined	10.16	0.126	0.89	0.92	
	NC	4.41	0.100	0.91	0.93	
	BD	2.59	0.112	0.87	0.90	
	SZ	2.68	0.124	0.89	0.91	

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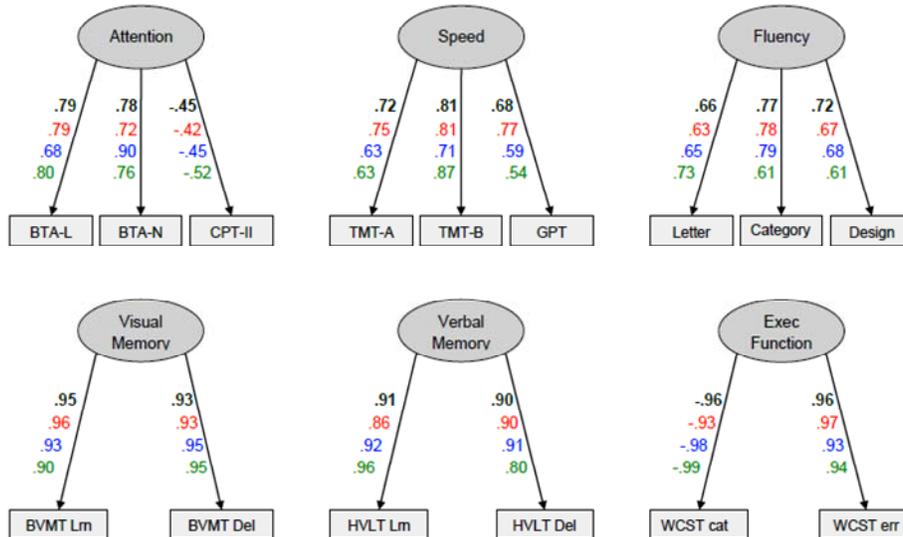
CFA Results: Remaining Models

Four-Factor Model

Group	χ^2/df	RMSEA	NNFI	CFI
Combined	11.01	0.132	0.90	0.92
NC	5.69	0.117	0.89	0.91
BD	2.75	0.118	0.87	0.89
SZ	2.76	0.127	0.88	0.91

One-Factor (*g*) Model

Group	χ^2/df	RMSEA	NNFI	CFI
Combined	18.89	0.176	0.76	0.80
NC	12.15	0.181	0.70	0.74
BD	3.95	0.165	0.78	0.81
SZ	4.65	0.171	0.72	0.76



Factor loadings: Entire Sample; Normal Controls; Bipolar disorder; Schizophrenia

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Comment

- In this CFA, the hypothesized six-factor model showed a good to excellent fit by all evaluative measures
- Other hypothesized models did not fit the data as well
- However, another ensemble of tests almost certainly would yield a different “optimal” solution
- Therefore, the question of whether to assess mental RFC using a multi-factor model probably should precede the selection of which domains to assess
 - My personal recommendation is to assess 3–6 domains

Other Big Issues

- Shall we use performance-based measures or informant rating scales, or both?
 - And who should administer them? Change models?
- How shall we validate decision criteria?
 - I know of no existing data defining disability “thresholds”
- Shall we use available measures or create a proprietary set that SSA creates, standardizes, and updates?
 - This would be my recommendation for many reasons
 - Existing tests become obsolete, raise royalty issues
- There is a theme: The need to design and conduct a couple studies

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Appendix E

Second Mental Cognitive Subcommittee Presentation

**Clinical Inference in the Assessment of
Mental Residual Functional Capacity**



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OIDAP Panel Meeting

10 June 2009

Methods of Inference

1. Pathognomonic sign approach
2. Pattern analysis
3. Level of performance or deficit measurement

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Content Model and Classification Recommendations

Pathognomonic Signs

- Characteristic of particular disease or condition
- High specificity
- Present vs. absent
- Often ignored questions
 - How frequent are they in healthy individuals?
 - How reliable are they?

Should the Babinski sign be part of the routine neurologic examination?

Timothy M. Miller, MD, PhD; and S. Claiborne Johnston, MD, PhD

- 10 physicians (5 neurologists & 5 others)
- Examined both feet of 10 participants
 - 9 w/ upper motor neuron lesions (8 unilateral; 1 bilateral)
 - 1 w/ no upper motor neuron lesion
- Babinski present in
 - 35 of 100 examinations of foot w/ UMN weakness (sensitivity)
 - 23 of 99 examinations of foot w/o UMN weakness (specificity)

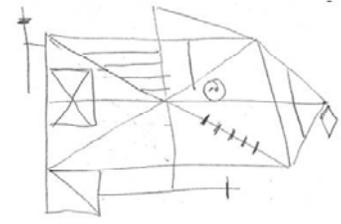
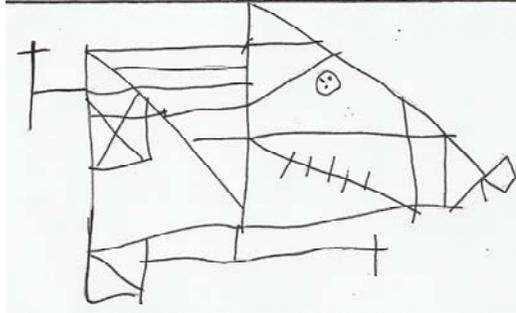
Neurology (2005)

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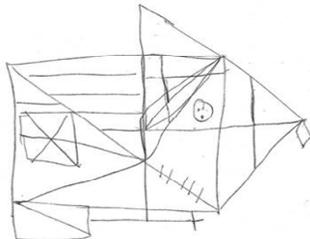
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Pathognomonic?

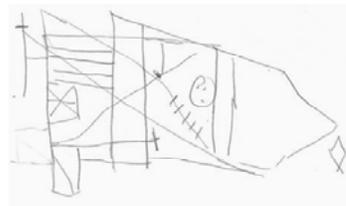
91-year-old Caucasian woman
14 years of educ (AA degree)
Excellent health
Rx: Floxin, vitamins
MMSE = 27/30
WAIS-R MOANS IQ = 109
Benton FRT = 22/27
WMS-R VR Immed. SS = 8



Jan. 2004: 68-year-old retired engineer with reduced arm swing, bradyphrenia & stooped posture. Diagnosed with atypical PD.



Apr. 2005: Returns for follow-up testing 2 months after CABG; thinks his memory has declined slightly but PD is no worse



Jan. 2007: Returns & wife reports visual hallucinations, thrashing in sleep, & further memory ↓ but his PD is no worse and he still drives

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Pathognomonic Signs: Limitations & Implications

- Are there any in clinical neuropsychology?
 - Unclear if there are any for a specific disease or condition
- Might be more prevalent in normal population than commonly thought
- Reliability is rarely assessed
- ➡ If we recommend that SSA rely on pathognomonic signs of impairment, we should not assume that successful job incumbents are free of such signs

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Pattern Analysis

- Recognizable gestalt of signs, symptoms, history, laboratory findings, and test results
- Most elaborate approach to inference
- Best for patients with typical presentations

Empirical Basis of Pattern Analysis

- Considerable empirical support
 - But much of it is pieced together from disparate studies
- Studies often involve discriminant function analyses
 - Other designs have been used (eg, comparing AD and HD patients on MMSE after matching for total score)

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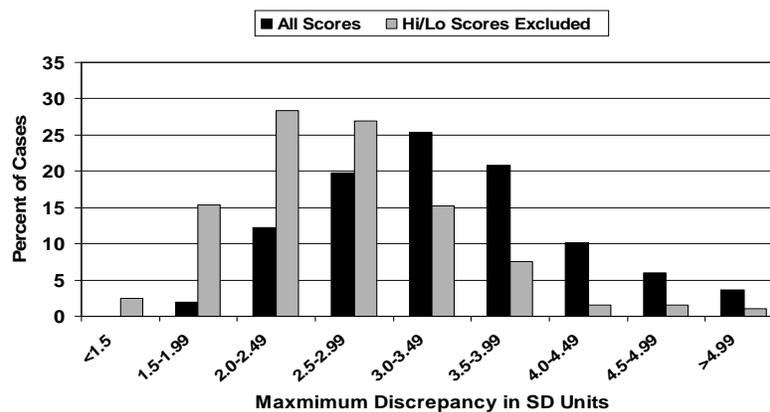
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Journal of the International Neuropsychological Society (2003), 9, 864–870.
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DOI: 10.1017/S1355617703960061

Examining the range of normal intraindividual variability in neuropsychological test performance

- Derived 32 z-transformed test scores for 197 healthy Ss
- Subtracted each person's lowest z-score from his or her own highest z-score to measure the "Maximum Difference" (MD)
- Resulting MD scores ranged from 1.6 - 6.1 ($M=3.4$)
- 65% produced MD scores ≥ 3.0 ; 20% had MDs ≥ 4.0
- Eliminating each persons' single highest and lowest test scores decreased their MDs, but 27% still produced MS values of 3.0 or greater

Intra-individual variability shown by 197 healthy adults



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Pattern Analysis: Limitations & Implications

- Applicability varies with typicality of patient
- Normal variation can be mistaken for meaningful patterns
- ➡ This approach probably mirrors the task of linking specific residual functional capacities to job demands more closely than the others
- ➡ It might be useful to think about linking specific RFCs to job demands using such statistical methods as cluster analysis or canonical correlation

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Level of Performance

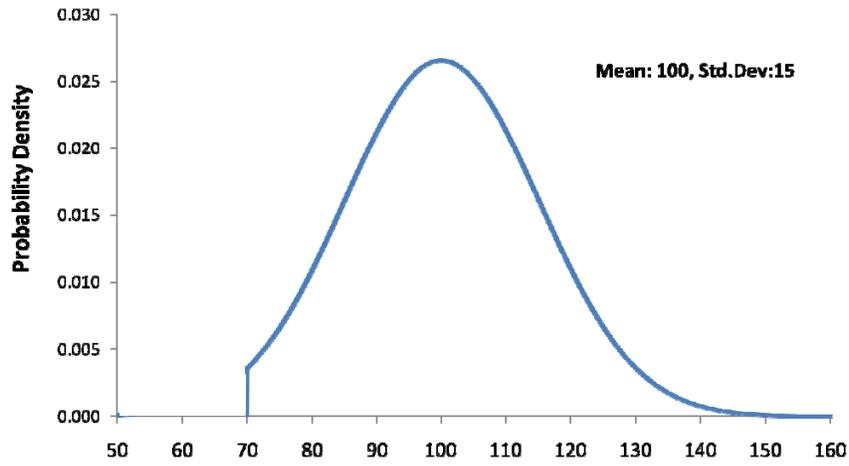
- Often used to detect impairments or deficits
- But, what is an impairment or deficit?
 - Deficient ability compared to normal peers?
 - Decline for individual (but normal for peers)?

Level of Performance: Deficit Measurement

- We infer *ability* from *performance*
 - But factors other than disease (eg, effort) can uncouple them
 - There is no one-to-one relationship between brain dysfunction and abnormal test performance *at any level*
- But even if other factors do not uncouple them, what is an *abnormal* level of performance?
- Thought experiment: Suppose we test the IQs of 1,000,000 perfectly healthy adults

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Would the distribution look like this?

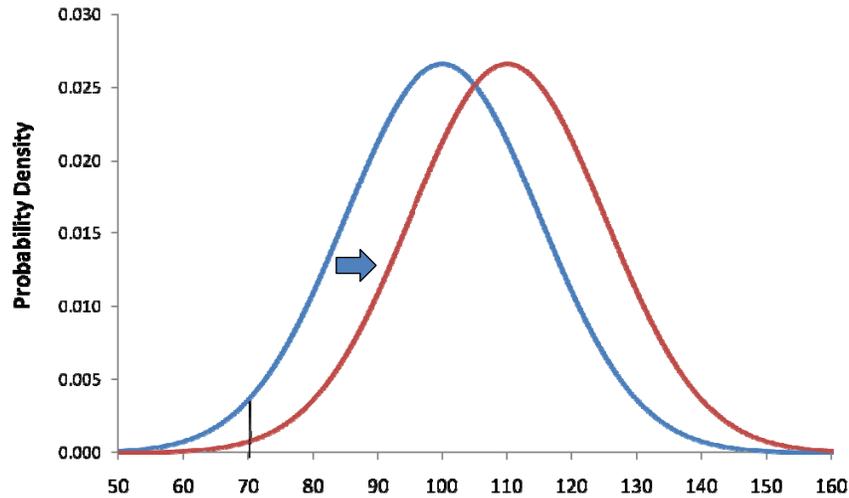


Probably not

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More likely, the distribution would be shifted up



Consequently

- If a distribution of one million IQ test scores is shifted up **10 points**, but remains Gaussian, then 4800 people will still score below 70
- How do we understand normal, healthy people with IQs below 70?
 - Chance?
 - Healthy but nonspecifically poor specimens?

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Logical Conclusions

- Some of those who perform in the lowest 2% of the distribution are normal
- Most of those who perform in the lowest 2% of the distribution are impaired
- The probability of impairment increases with distance below the population mean

Cutoff Scores

- Help decide whether performance is abnormal
- Often set at 2 *sd* below mean, but 1.5 and even 1 *sd* below mean have been used
- If test scores are normally distributed, these cutoffs will include 2.3% to 15.9% of normal individuals on any single measure

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Multiple Measures

- When a test battery includes multiple measures, the number of normal healthy individuals who produce abnormal scores increases
- So does the number of abnormal scores they produce
- Using multiple measures complicates the interpretation of abnormal performance on test batteries

The binomial distribution can be used to predict how many abnormal scores healthy persons will produce on batteries of various lengths

Probability of obtaining 2 or more “impaired” scores based on selected cut-off criteria & number of tests administered

Cut-off	Number of Tests Administered		
	10	20	30
--1.0 <i>SD</i>	.50	.84	.95
--1.5 <i>SD</i>	.14	.40	.61
--2.0 <i>SD</i>	.03	.08	.16

Ingraham & Aiken (1996)

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Journal of the International Neuropsychological Society (2008), 14, 436–445.
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doi: 10.1017/S1355617708080387

Frequency and bases of abnormal performance by healthy adults on neuropsychological testing

- Participants
 - 327 reasonably healthy adults without current psychiatric illness or substance abuse/dependence
- Procedure
 - Administered 25 cognitive measures; obtained T-scores
 - Classified T-scores as normal or “abnormal” based on three cutoffs: <40, <35, and <30
 - Computed Cognitive Impairment Indices (CII) as the number of abnormal scores each person produced
 - Used both unadjusted and demographically adjusted scores

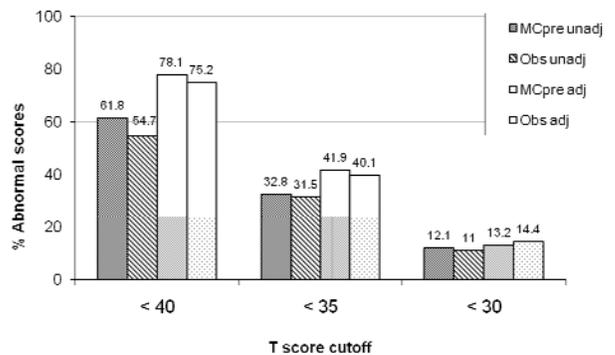
- We estimated how many individuals would produce 2 or more abnormal scores using three T-score cutoffs
 1. Based on binomial distribution (BN)
 2. Based on Monte Carlo simulation (MC) using unadjusted T-scores
 3. Based on Monte Carlo simulation (MC_{adj}) using adjusted T-scores

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Test/Measure	M ± SD	Test/Measure	M ± SD
Mini-Mental State Exam	28.1 ± 1.7	Rey Complex Figure	31.3 ± 4.3
Grooved Pegboard Test		Clock Drawing	9.5 ± 0.8
Dominant hand	80.4 ± 28.1	Design Fluency Test	14.2 ± 7.2
Non-dom hand	90.5 ± 34.7	Wechsler Memory Scale	
Perceptual Comparison Test	64.5 ± 16.4	Logical Memory I	26.3 ± 6.9
Trail Making Test		Logical Memory II	22.4 ± 7.5
Part A	34.9 ± 17.0	Hopkins Verbal Learning Test	
Part B	95.0 ± 69.4	Learning	24.6 ± 4.8
Brief Test of Attention	15.4 ± 3.7	Delayed recall	8.7 ± 2.6
Modified WCST		Delayed recognition	10.4 ± 1.6
Category sorts	5.3 ± 1.3	Brief Visuospatial Memory Test	
Perseverative errors	2.5 ± 3.9	Learning	22.2 ± 7.5
Verbal Fluency		Delayed recall	8.7 ± 2.7
Letters cued	28.2 ± 9.2	Delayed recognition	5.6 ± 0.7
Category cued	44.8 ± 11.4	Prospective Memory Test	0.6 ± 0.7
Boston Naming Test	28.2 ± 2.6		
Benton Facial Recognition	22.4 ± 2.3		

25 Measure Battery



Predicted and observed percentages of participants who produced 2 or more abnormal test scores (y axis) as defined by three different cutoffs (<40, <35, and <30 T-score points)

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Spearman correlations between Cog Imp Index scores based on unadjusted T-scores and age, sex, race, years of education and estimated premorbid IQ

No. of tests	T-score cutoff	Mean (SD)	Age	Sex	Race	Educ.	NART IQ
25	< 40	3.6 (4.4)	.573**	-.029	.215**	-.327**	-.360**
25	< 35	1.6 (2.7)	.528**	-.039	.186*	-.325**	-.354**
25	< 30	0.5 (1.3)	.409**	-.066	.176	-.312**	-.318**

* = $p < 0.001$; ** = $p < 0.0001$

This study shows that

- Neurologically normal adults produce abnormal test scores
 - Rate varies with battery length & cutoff used to define abnormal
- This is not due purely to chance
 - Varies with age, education, sex, race and est. premorbid IQ
 - Demographically adjusting scores eliminates the relationship between these characteristics and abnormal performance
- Findings underscore distinction between “abnormal” test performance and “impaired” functioning
 - Test performance can be abnormal for many reasons: impaired functioning is but one

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Returning to the question of what cut-off we should use to define abnormal performance...

- Stringent cut-offs decrease test sensitivity
- Liberal cut-offs decrease test specificity
- Adding tests increases the risk of type I errors
- Excluding tests increases the risk of type II error
- As in most endeavors, we must exercise judgment

Decline from Premorbid Ability

- If we know a person's "premorbid" ability, then it is relatively simple to determine decline
 - Unfortunately, we rarely know this
 - Therefore, we have to estimate it
 - So how do we do that?
- Research has focused on estimating premorbid IQ

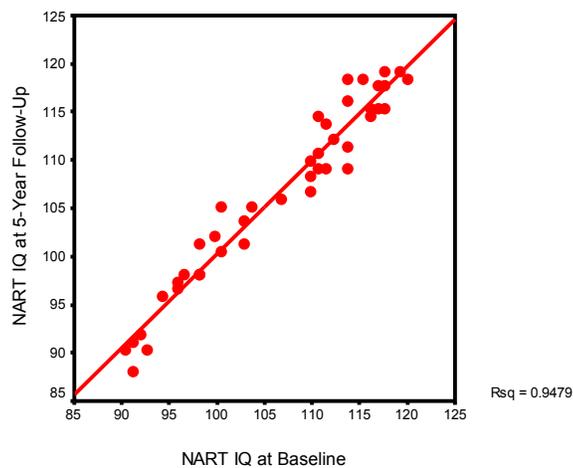
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Estimating Premorbid IQ

- Demographic prediction
 - Barona formula $SE_{est} = 12$ points (95% CI = ± 24 points)
- Word reading tests are more accurate
 - Except for persons with very limited education
 - And those with aphasia, reading disorders, or severe dementia
 - And persons for whom English is a second language

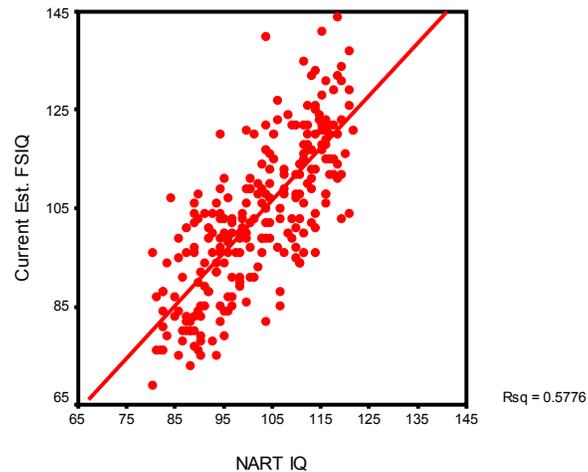
Stability of NART-R IQ Estimates



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Correlation of NART-R and WAIS-R



But how well does the NART-R predict cognitive abilities other than IQ?

Journal of the International Neuropsychological Society (2005), 11, 784–787.
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DOI: 10.1017/S1355617705050939

BRIEF COMMUNICATION

The use of word-reading to estimate “premorbid” ability in cognitive domains other than intelligence

Administered 26 cognitive measures to 322 healthy adults

Regressed each on age, saved the residuals, and correlated these with NART-R scores

Compared the correlation of NART-R and IQ with correlations of the NART-R and other age-adjusted cognitive measures

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Table 1. Pearson r (or Spearman ρ) correlation of the NART-R with age-corrected scores on each cognitive test, standard errors of the estimates of NART-R predicted performances on the same measures, and standard scores corresponding to 5th percentile of NART-R predicted minus actual scores for each cognitive test variable

Test/variable	Correlation ¹	$p <$	SE_{Est}	5th %ile ²
Verbal IQ (prorated) ³	$r = .755$	.0001	9.4	13.4
Full Scale IQ (prorated) ³	$r = .724$	.0001	10.1	15.4
GPT Dominant Hand	$\rho = -.286$	.0001	12.9	26.7
GPT Nondominant Hand	$\rho = -.276$	.0001	13.6	24.5
Trail Making Test, Part A	$\rho = -.237$	.0001	14.6	35.3
Trail Making Test, Part B	$\rho = -.528$	.0001	12.1	25.5
Brief Test of Attention	$r = .319$	.0001	14.2	31.5
mWCST Categories	$\rho = .311$	.0001	14.3	37.8
mWCST Perseverative Errors	$\rho = -.259$	.0001	14.5	33.4
Cognitive Estimation Test	$r = -.500$	.0001	13.0	27.1
CPT Hit Reaction Time	$r = .071$	n.s.	15.0	33.1
CPT Discrimination (d')	$r = .061$	n.s.	15.0	39.8
Boston Naming Test	$\rho = .384$	.0001	13.0	28.7
Word Fluency (Letters)	$r = .481$	.0001	13.1	25.7
Word Fluency (Category)	$r = .386$	.0001	13.8	29.0
Design Fluency Test	$r = .403$	.0001	13.7	27.4
Benton Facial Recognition	$r = .284$	.0001	14.4	30.3
Rey CFT (Copy)	$\rho = .328$	.0001	14.2	31.6
HVLT-R Learning	$r = .356$	.0001	14.0	31.6
HVLT-R Delay	$\rho = .349$	.0001	14.2	35.5
HVLT-R Recognition	$\rho = .142$	.05	14.4	33.0
BVMT-R Learning	$r = .318$	.0001	14.2	31.5
BVMT-R Delay	$r = .300$	.0001	14.3	31.1
BVMT-R Recognition	$\rho = .119$	.05	15.0	39.6
WMS-R Logical Memory I	$r = .419$	.0001	13.6	29.7
WMS-R Logical Memory II	$r = .422$	.0001	13.6	28.3
WMS-R Visual Reproduction I	$r = .343$	.0001	14.1	33.5
WMS-R Visual Reproduction II	$r = .258$	.0001	14.5	33.8

NART-R correlation with FSIQ = .72

NART-R correlations with other test scores ranged from -.53 to .48

(Every one of the latter was significantly smaller than the correlation with FSIQ)

¹Spearman rank order correlations were used for cognitive measures whose distributions were characterized by skewness or kurtosis > 1.0 ; Pearson product-moment correlations were used for all others. ²Difference between NART-R estimated Full Scale IQ and each standardized test score that included the 5% of participants with the largest discrepancies. ³Prorated using Ward's (1990) seven-subtest short form of the WAIS-R or WAIS-III.

Estimating Premorbid Abilities

- An *essential and unavoidable* aspect of every neuropsychological examination
- If we don't do explicitly, then we do it implicitly
- Even the best methods yield ballpark estimates
- We're better at estimating premorbid IQ than other premorbid abilities

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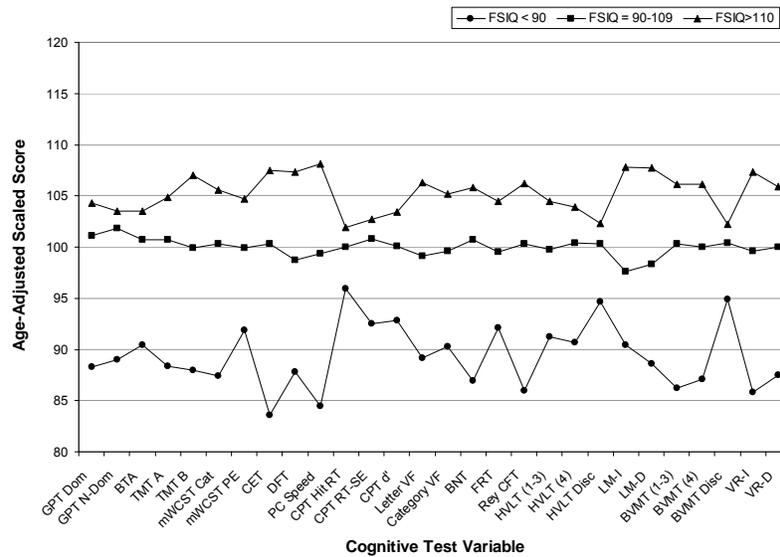
Journal of the International Neuropsychological Society (2004), 10, 82-90.
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 DOI: 10.1017/S1355617704101100

How well does IQ predict neuropsychological test performance in normal adults?

Examined 28 scores derived from 16 cognitive tests that were administered to 221 reasonably healthy adults

Grouped participants by WAIS-R Full Scale IQ into three groups:

N = 37	Below average (BA)	FSIQ < 90	Mean = 83
N = 106	Average (A)	FSIQ 90-109	Mean = 101
N = 78	Above average (AA)	FSIQ > 109	Mean = 121



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Intelligence and Cognitive Functioning

- Correlations between intelligence and other cognitive abilities are stronger below than above IQ scores of 110
 - *It is less likely that smart people will do well on other tests than it is that dull people will do poorly*
- A normal person with an IQ of 85 is likely to produce “impaired” scores on about 10% of other cognitive tests

Deficit Measurement: Limitations & Implications

- No isomorphic relationship between performance and ability
- Adding tests can increase false positive (type 1) errors
- Setting stringent cut-offs can increase misses (type 2) errors
- NART predicts pre-morbid IQ better than other abilities
- Raising “cut-off” scores for patients of above average IQ can compound the problem of multiple comparisons

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Deficit Measurement: Limitations & Implications

- ➡ Many – if not most – successful job incumbents likely fall short of meeting one or more of their job demands
- ➡ What cutoff in the distribution of an ability shown by successful job incumbents should we use to define sufficient RFC for someone to do that job? This will directly affect the percentage of applicants who will be found disabled
- ➡ Factors other than impairment, like effort, can uncouple the linkage between performance and ability
- ➡ Work demands, RFC, and “deficit” vs. “impairment”

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