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# Concurrent validity of the Mattis Dementia Rating Scale

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# CONCURRENT VALIDITY OF THE MATTIS DEMENTIA RATING SCALE

BY

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Running head: CONCURRENT VALIDITY

# Concurrent Validity of the Mattis Dementia Rating Scale

Abstract

The Dementia Rating Scale (DRS) is a brief, comprehensive screening instrument for neurological impairment. The DRS has a low floor and enables progressive levels of dementia to be measured. The purpose of this study was to evaluate the concurrent validity of the DRS. Eighteen subjects from nursing homes and personal care homes diagnosed with mild to moderate Dementia of the Alzheimer's Type were involved in the research. The score on the DRS was correlated with the raw scores on the Block Design and Vocabulary subtests of the WAIS-III. Research indicates that the performance on the Block Design subtest is a sensitive indicator of cognitive decline. On the other hand, the performance on the Vocabulary subtest is resistant to cognitive decline and provides a stable measure of ability. The Block Design subtest score moderately correlated with the DRS score ($r = .56$) which lends support for the concurrent validity of the DRS. The Vocabulary subtest score, however, also moderately correlated with the DRS score ($r = .55$). The Vocabulary subtest score may not be stable over the course of Dementia of the Alzheimer's type. Factors within the population that may have affected the outcome are discussed. Recommendations for future research are presented.

Acknowledgments

I first want to thank my committee members Dr. Lawhon, Dr. Mooney, and Dr. Ranson for their counsel and assistance in the development and completion of this project. I appreciate their hard work and flexibility in all aspects of the research and thesis. Additionally, I want to thank Dr. O'Keefe for his input, particularly in the development of the research design. I also want to thank psychology interns Lynn Sanders, Cynthia Williams, and Jennifer Saunders for their assistance in testing subjects in the Beckley, WV, area.

I could not have completed this project without the support of my family and friends. My parents, Don and Eldora, and my great aunt, Gladys Ray, have always encouraged and supported all of my endeavors, including academic. I thank them for their love and guidance. I want to thank Kent and Tonya Davis of Beckley, WV, and Anna L. Vealey and George and Nancy Smith of Ona, WV, for providing me with encouragement, support, and, when necessary, a roof over my head throughout this process. I could not have finished this project within this time frame if not for their assistance. I also want to thank my good friends Erin Trimble and Selene Pratt who provided a push when necessary and reassurance when needed.

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Seabrook at the Prime of Life Adult Day Care in Beckley, WV, and Dr. Roger Mooney and the staff at Pinecrest Hospital. I appreciate their support of this research.

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# Concurrent Validity of the Mattis Dementia Rating Scale

Early studies of the Wechsler Scales regarding the diagnosis of various types of neurological impairments resulted in the identification of cognitive abilities sensitive to the impairments. Subtests involving abstract reasoning, memory, concentration and response speed were identified as the most likely subtests to be affected by neurological impairment (Lezak, 1976). Although most neuropsychological instruments could discriminate between patients with and without neurological impairment, many could not assess the progression of the impairment due to floor effects (Bornstein, 1992). In other words, the low end of the instruments' items did not measure abilities low enough to be sensitive to the progression of dementia. The Dementia Rating Scale (DRS) was developed by Steven Mattis in 1973 to fill this role and provide clinicians and researchers with an instrument that would measure the progressive cognitive deterioration of demented patients over time (Mattis, 1988). Although not investigated as part of the development of the DRS, subsequent research has addressed the issues of reliability and validity.

Mattis (1988) reports the cognitive abilities sensitive to dementia were identified when developing the tasks on the DRS. The tasks that make up the final version of the DRS "are common ones, taken primarily from clinical procedures and traditional assessment methods" (Mattis, p. 1). The DRS consists of five subscales: Attention, Initiation/Perseveration, Construction, Conceptualization, and Memory. In each subscale, the most difficult items are presented first. If the person passes the screening item or items in a subscale, the remaining items in the subscale are scored as passed. As a result,

administration time is reduced for examinees who can pass the screening items. Although the DRS is described as theoretically sound (Mattis) and easily administered (Fabry, 1992), evidence supporting the reliability and the validity is limited.

The test-retest reliability coefficient of the DRS Total Score with subjects diagnosed with Dementia of the Alzheimer's Type was .97. Other test-retest reliability coefficients with the subscales ranged from .92 to .61. Mattis (1988) cited validity correlation coefficients with the DRS Total Score of .70 with the Wechsler Memory Scale memory quotient, of .67 with the WAIS Full Scale Intelligence Quotient, and of .59 with cortical metabolism. Vitaliano, Breen, Russo, Albert, Vitiello, and Prinz (1984) compared patients with no dementing process to patients diagnosed with mild Dementia of the Alzheimer's Type and moderately to severe Dementia of the Alzheimer's Type. The mildly demented patients performed better than the moderately to severely demented patients, and the authors concluded that the DRS is a valid instrument to measure varying degrees of dementia. According to Mattis, "Large and significant differences were found across mean DRS Total Scores for controls, mild dementia, and moderately severe dementia groups" (p. 24). Bobholz and Brandt (1993) found a moderately high correlation (Pearson $r = .78$) between the total scores of the DRS and the Mini-Mental State Examination (MMSE) administered to 50 patients. While the authors found support for the validity of the DRS total score, the validity of the subscales was not supported by the research.

In 1991, Shay, Duke, Conboy, Harrell, Callaway, and Folks attempted to examine the validity of the DRS in predicting degree of impairment. Sixteen control subjects and 42

subjects diagnosed with Dementia of the Alzheimer's Type were screened by a neurologist, psychiatrist, and neuropsychologist. Scores for the DRS and the Instrumental Activities of Daily Living (IADL), a functional behavior screening instrument, were obtained and compared to a consensus rating on a clinical rating scale. The authors found an 83% agreement between the mild range of the DRS and the mild dementia rating determined by the clinical team. In the moderate severity group, there was a 71% agreement between the DRS and the rating by the clinical team. The authors concluded that the DRS is a reasonably accurate predictor of the degree of impairment in Dementia of the Alzheimer's Type. The authors further reported that when the DRS was used in combination with the IADL, there was a 95% agreement with the mild dementia rating and an 81% agreement with the moderate dementia rating determined by the clinical team.

Green, Woodard, and Green (1995) assessed the DRS's criterion related validity in 22 elderly patients with mild cognitive impairments and 48 patients with no dementing process. The DRS accurately diagnosed 95% of the patients and 100% of the control subjects. The authors concluded that while this study provides evidence that the DRS has criterion related validity, other studies are necessary to add to the growing evidence that the DRS is a valid clinical instrument.

The Wechsler Adult Intelligence Scale - Revised (WAIS-R) has been extensively studied in relationship to Dementia of the Alzheimer's Type. Patients diagnosed with Dementia of the Alzheimer's Type will typically exhibit a discrepancy between Verbal IQ (VIQ) scores and Performance IQ (PIQ) scores. "As expected, the PIQ score is lower than the mean VIQ score because the verbal scores tend to be somewhat more resilient

and less sensitive to the effects of this neurologic condition" (Tulsky & Zhu, 1997, pp. 148-149). Among the verbal subtests, Vocabulary has the highest average reliability coefficient of .93 (Tulksy & Zhu). When studying the long-term stabilities of the Wechsler Adult Intelligence Scale - Revised, the Wechsler Memory Scale - Revised, and the Auditory-Verbal Learning Test, Ivnik, Smith, Malec, Petersen, and Tangalos (1995) found verbal intellect to be the most stable with a long-term stability coefficient of .86. The WAIS-R Vocabulary subtest is a good estimate of premorbid intelligence and does not tend to be sensitive to diffuse or bilateral lesions (Kauffman, 1990). The Vocabulary subtest is highly stable and less susceptible to the effects of Dementia of the Alzheimer's type. On the other hand, the Block Design subtest is sensitive to any type of organic damage, including Dementia of the Alzheimer's Type (Kauffman, 1990). According to Lezak (1983), "block design scores tend to be lower in the presence of any kind of brain injury" (p. 220). Rasmusson, Carson, Brookmeyer, Kawas, and Brandt (1996) identified poor performance on the Block Design subtest of the WAIS-R as one of the factors that predicted a more rapid cognitive decline in patients with Dementia of the Alzheimer's Type.

Overall, research (Bobholz & Brandt, 1993; Fabry, 1992; Green et al., 1995) indicates the need for additional research to evaluate the validity of the DRS in the diagnosis of dementia. Performance on the Vocabulary subtest of the WAIS-R is the most stable measure of ability while performance on the Block Design subtest is the most sensitive to any type of neurological impairment (Ivnik et al., 1993; Rasmusson et al., 1996; Tulsky & Zhu, 1997). The purpose of this study was to determine the strength of

the relationship between the DRS and the Vocabulary and Block Design subtests on the WAIS-III. Total scores obtained on the DRS were compared to the raw scores obtained on the Vocabulary and Block Design subtests to evaluate the concurrent validity of the DRS. The hypotheses were:

Null Hypothesis$_1$: There will be no significant correlation between the Block Design subtest of the WAIS-III and the DRS.

Alternate Hypothesis$_1$: There will be a significant correlation between the Block Design subtest of the WAIS-III and the DRS.

Null Hypothesis$_2$: There will be no significant correlation between the Vocabulary subtest of the WAIS-III and the DRS.

Alternate Hypothesis$_2$: There will be a significant correlation between the Vocabulary subtest of the WAIS-III and the DRS.

## Method

### Subjects

Eighteen subjects were assessed for the purposes of this study. The subjects had a diagnosis of Dementia of the Alzheimer's Type (DAT) according to the diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition (American Psychiatric Association, 1994). The diagnoses were made by a psychologist, psychiatrist, or physician specializing in neurology or gerontology from each of the facilities referring subjects for the study. Seven subjects were from the Chateau Grove Personal Care Home in Ona, WV, eight from Pinecrest Hospital in Beckley, WV, two from Wayne County Continuous Care Nursing Home in Wayne, WV, and one from the Prime of Life Adult

Day Care in Beckley, WV. The ages of the subjects ranged from 74 to 85, with a mean age of 81. Fifteen of the subjects were female and three were male. Seventeen of the subjects were Caucasian and one was African-American. To minimize floor effects, only subjects with a Global Deterioration Scale (GDS) stage of 5 or less were included in the study.

Instruments

Wechsler Adult Intelligence Scale. In 1997, the WAIS-R was revised to the Wechsler Adult Intelligence Scale - Third Edition (WAIS-III). The revisions included the extension of the floor for the Full Scale IQ, Verbal IQ, and Performance IQ to 45, 48, and 47 respectively. Additionally, the age range of the WAIS-III was increased to include persons through age 89, as opposed to age 74 on the WAIS-R (Tulsky & Zhu, 1997). The average reliability coefficient of the Vocabulary subtest was .93 and the validity coefficient of the Vocabulary subtest of the WAIS-III with the WAIS-R was .90. The average reliability coefficient of the Block Design subtest was .86 and the validity coefficient of the Block Design subtest of the WAIS-III with the WAIS-R was .77 (Tulsky & Zhu).

Global Deterioration Scale. Reisberg, Ferris, DeLeon, and Crook (1982) report that the Global Deterioration Scale (GDS) was developed in response to the lack of a widely used instrument to rate the progressive cognitive decline of dementia. The GDS has seven stages, with stage one representing no cognitive decline and stage seven representing severe cognitive decline. Descriptive criteria to determine the appropriate ratings are

provided for each stage. General cognitive, behavioral, and functional skills are assessed by the stages of the GDS (Reisberg et al.).

Gottlieb, Gur and Gur (1988) investigated the inter-rater reliability of the GDS. Two raters rated 43 patients with Dementia of the Alzheimer's Type and the intraclass correlation was .82. Reisberg et al. (1982) investigated the validity of the GDS and found significant correlations with 25 of 26 psychometric measures and with 13 of 19 cognitive items of the Inventory of Psychic and Somatic Complaints in the Elderly. Reisberg et al. also reported finding significant relationships between ratings on the GDS and physical changes in the brain. The correlation between the GDS and the CT scan ratings of ventricular dilation was .62.

Procedure

Each subject was administered the Vocabulary and Block Design subtests of the WAIS-III and the DRS by the author of the study or a psychology intern student. Each test was administered according to the instructions in the instrument's manual. All three tests were administered to a subject within a one week period. The raw scores, rather than the scaled scores, of the Block Design and Vocabulary subtests of the WAIS-III were used to help control for floor effects.

Analysis of Data

Pearson product-moment correlation coefficients were obtained for the DRS Total Score and the raw scores (see Table 1) for the Vocabulary and Block Design subtests of the WAIS-III . Alpha was set at .05. Significance for the correlation coefficients was

determined using the Rank Correlation Test for Significance of Pearson r (Weinberg, Schumaker, & Oltman, 1981).

## Results

Null hypothesis$_1$ and null hypothesis$_2$ were rejected at the .05 level. The DRS moderately correlated with the Vocabulary subtest of the WAIS-III ($r = .55$) and moderately correlated with the Block Design subtest of the WAIS-III ($r = .56$) (see Table 1). Based on the Rank Correlation Test for the Significance of Pearson r, the Vocabulary and Block Design correlations were significant at the .05 level ($t = 1.96$ and $t = 2.33$, respectively). Scores on the DRS ranged from 37 to 114 with a mean of 85.88 and a standard deviation of 21.33. Scores on the Vocabulary subtest ranged from one to 39, with a mean of 17.66 and a standard deviation of 10.86. Scores on the Block Design subtest ranged from zero to 18 with a mean of 4.55 and a standard deviation of 4.91 (see Table 2).

## Discussion

The purpose of this study was to determine the strength of the relationship between the DRS and the Vocabulary and Block Design subtests on the WAIS-III. The scores obtained on the DRS were correlated with the scores obtained on the Vocabulary and Block Design subtests. The results indicated that a moderate (positive) relationship exists between the DRS and both the Vocabulary and Block Design subtests of the WAIS-III, although less with Vocabulary than with Block Design. When three subjects with DRS scores reflecting severe dementia (scores below 60) were omitted from the data pool, the

correlation between the Vocabulary subtest and the DRS decreased to .35 indicating Vocabulary is more stable in mild to moderate dementia.

The correlation of the DRS and the Block Design subtest support the concurrent validity of the DRS. The results are consistent with the research of Lezak (1983) and Rasmusson et al. (1996). Block Design scores dropped as the severity of cognitive decline increased. Research (Ivnik et al., 1995; Tulsky & Zhu, 1997) suggests that the Vocabulary subtest score should remain relatively constant in patients with mild to moderate Dementia of the Alzheimer's Type. The results, however, indicated that the Vocabulary subtest was significantly affected by the dementing process. The discrepancy in the research may have been the result of the subjects in the population with DRS scores reflecting severe dementia, the education levels of the population, the small size of the population, the larger number of moderately demented patients in the population, or the changes made in the revising of the WAIS-III from the WAIS-R. When further analysis was done, the Vocabulary subtest was more resistive to the effects of dementia than Block Design. The results may indicate that the Vocabulary subtest of the WAIS-III was resistant to the effects of mild to moderate Dementia of the Alzheimer's Type, but not as resistant to the effects of moderate to severe Dementia of the Alzheimer's Type. The population used in the study was from nursing homes and personal care homes and tended to obtain DRS scores in the moderate and severe range. Because Dementia of the Alzheimer's Type is characterized by progressive and global neurological impairment, the Vocabulary subtest scores, while resistant to the effects of Dementia of the Alzheimer's Type, are affected by moderate to severe levels of the neurologic condition.

Overall, the results indicate that the DRS is a valid clinical instrument in screening for Dementia of the Alzheimer's Type in nursing home and personal care home residents of southern and south western West Virginia. The research adds to a growing body of evidence for the validity of the instrument. The author would recommend further research with a larger number of subjects functioning at different levels of Dementia of the Alzheimer's Type.

Table 1

Pearson Correlation Coefficients

| | DRS | Vocabulary | Block Design |
|---|---|---|---|
| DRS | 1.00000 | 0.55060 | 0.55502 |
| Vocabulary | 0.55060 | 1.00000 | 0.43326 |
| Block Design | 0.55502 | 0.43326 | 1.00000 |

Table 2

Descriptive Statistics

| Variable | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| DRS | 85.88 | 21.33 | 37 | 114 |
| Vocabulary | 17.66 | 10.86 | 1 | 39 |
| Block Design | 4.55 | 4.91 | 0 | 18 |

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# Appendix A

## Literature Review

## Literature Review

With Americans living longer than ever before, the number of people diagnosed with dementia of the Alzheimer's type (DAT) is increasing. Subsequently, recent research has focused on the causes, progression and treatment of DAT (Reisberg, 1985). A number of instruments have been used to measure the cognitive impairment associated with DAT. One of the instruments, the Mattis Dementia Rating Scale (DRS), is a brief, comprehensive instrument widely used in the clinical setting to screen for and measure cognitive impairment. The DRS assesses orientation; attention; cognitive processing; immediate, recent, past, and remote memory; language; and visuomotor function. The DRS is more comprehensive than most screening instruments, however, it takes longer to administer than many screening instruments and therefore may not be the screening instrument of choice in the clinical setting (Baker, 1989). Although not investigated as part of the development of the DRS, subsequent research addresses the issues of reliability and validity.

Mattis (1988) reports the cognitive abilities sensitive to dementia were identified when developing the tasks on the DRS. The tasks that make up the final version of the DRS "are common ones, taken primarily from clinical procedures and traditional assessment methods" (Mattis, p. 1). The DRS consists of five subscales: Attention, Initiation/Perseveration, Construction, Conceptualization, and Memory. In each subscale, the most difficult items are presented first. If the person passes the screening item or items in a subscale, the remaining items in the subscale are scored as passed. As a result, administration time is reduced for examinees who can pass the screening items. Although

the DRS is described as theoretically sound (Mattis) and easily administered (Fabry, 1992), evidence supporting the reliability and the validity is limited.

Relatively few studies have assessed the validity of the DRS (Bornstein, 1992). In addition, small sample sizes have limited the evidence of validity that exists in the literature for the DRS. (Monsch, Bondi, Salmon, Butters, Thal, Hansen, Wiederholt, Cahn, & Klauber, 1995). "The DRS does warrant further research use with Alzheimer patients...to establish both its validity as a diagnostic devise and the reliabilities associated with its structure and its administration" (Fabry, 1992, p. 275). Nadler, Relkin, Cohen, Hodder, Reingold, and Plum (1995) looked at the clinical utility of the DRS, the Mini-Mental State Exam and the Modified Mini-Mental State Exam. A total of 120 nursing home residents were studied: 57 demented and 63 non-demented. All three measures were equal in accuracy of classification. The authors found that when used with nursing home residents, the instruments resulted in a high number of false positive diagnoses. Lower education level, advanced age, and history of depression were identified as factors contributing to the high number of false positives. Therefore, the authors suggested using a lower cutoff score when using the instruments to screen for dementia in nursing home residents.

Green, Woodard, and Green (1995) assessed the DRS's criterion related validity in 22 elderly patients with mild cognitive impairments and 48 patients with no dementing process. The DRS accurately diagnosed 95% of the patients and 100% of the control subjects. The authors concluded that while this study provides evidence that the DRS has criterion related validity, other studies are necessary to add to the growing evidence that the DRS is a valid clinical instrument.

Bobholz and Brandt (1993) examined the relationship between the DRS and the Mini Mental State Examination (MMSE) in 50 patients with cognitive impairment of various etiologies and severities. A significant correlation (Pearson r = .78) was found indicating that the two instruments measure overlapping mental abilities. However, the validity of some of the DRS subscales and corresponding MMSE items was not well supported. For example, the attention item of the MMSE did not correlate significantly with the Attention subscale of the DRS. Also, the memory subscale of the DRS did not correlate significantly with the memory items of the MMSE. Therefore, the authors suggested that the DRS and the MMSE be used as screening devises; however, if cognitive impairment is found, a complete neuropsychological battery needs to be administered.

While research has questioned the validity of the subscales of the DRS, Woodard, Salthouse, Godsall, and Green (1996) provided evidence to support the validity of some of the subscales. The authors investigated the validity of the DRS's subscales in patients with DAT. One hundred seventy-one patients diagnosed with DAT were given the DRS and an abbreviated DRS. The research supports the validity of the Memory, Construction, and Conceptualization subscales of the DRS and of the abbreviated DRS.

Hofer, Piccinin, and Hershey (1996) identified five factors measured by the DRS. The factors identified were: Long-term memory (verbal recall)/Verbal Fluency, Construction, Memory SAR (short-term apprehension retrieval)/TSR (broad recognition), Initiation/Perseveration, and Simple Commands/Attention. The authors determined that the DRS was effective for differentiating demented from non-demented patients and concluded the DRS is a valid screening instrument. Research by Vangel and Lichtenberg

in 1995 also examined the validity of the DRS by studying 90 cognitively intact and 105 cognitively impaired individuals. Eighty-seven percent of all the subjects were correctly classified by the DRS. The authors concluded that the DRS is useful in discriminating intact and neurologically impaired persons.

Mattis (1988) cited validity correlation coefficients with the DRS Total Score of .70 with the Wechsler Memory Scale memory quotient, of .67 with the WAIS Full Scale Intelligence Quotient, and of .59 with cortical metabolism. Vitaliano, Breen, Russo, Albert, Vitiello, and Prinz (1984) compared patients with no dementing process with patients diagnosed with mild Dementia of the Alzheimer's Type and moderately to severe Dementia of the Alzheimer's Type. The mildly demented patients performed better than the moderately to severely demented patients, and the authors concluded that the DRS is a valid instrument to measure varying degrees of dementia. According to Mattis, "Large and significant differences were found across mean DRS Total Scores for controls, mild dementia, and moderately severe dementia groups" (p. 24).

In 1991, Shay, Duke, Conboy, Harrell, Callaway, and Folks examined the validity of the DRS in predicting degree of impairment. Sixteen control subjects and 42 subjects diagnosed with Dementia of the Alzheimer's Type were carefully screened by a neurologist, psychiatrist, and neuropsychologist. Scores for the DRS and the Instrumental Activities of Daily Living (IADL), a functional behavior screening instrument, were obtained and compared to a consensus rating on a clinical rating scale. The authors found an 83% agreement between the mild range of the DRS and the mild dementia rating determined by the clinical team. In the moderate severity group, there was a 71%

agreement between the DRS and the rating by the clinical team. The authors concluded that the DRS is a reasonably accurate predictor of the degree of impairment in Dementia of the Alzheimer's Type. The authors further reported that when the DRS was used in combination with the IADL, there was a 95% agreement with the mild dementia rating and an 81% agreement with the moderate dementia rating determined by the clinical team.

One of the most comprehensive studies of the clinical validity of the DRS was conducted by Monsch, Bondi, Salmon, Butters, Thal, Hansen, Wiederholt, Cahn, and Klauber in 1995. Unlike other validity studies of the DRS, the study utilized a total of 359 subjects: 254 outpatients with DAT and 105 healthy elderly subjects. The authors found that a cutoff score of 129 or less detected DAT 98 % of the time. Also, the Memory and Initiation/Perseveration subscales correctly classified subjects 98 % of the time. The authors concluded that the DRS is a valid clinical instrument and that the Memory and Initiation/Perseveration subtests may be suitable for an abbreviated version of the DRS.

The DRS has also been researched as an instrument useful in differential diagnosis. Salmon, Kwo-on-Yuen, Heindel, Butters, and Thal (1989) studied the ability of the DRS to differentiate between DAT and Huntington's disease (HD). Each of these conditions has a unique pattern of cognitive deterioration. Twenty-three patients diagnosed with DAT and 23 patients diagnosed with HD were matched in terms of their DRS Total score. The DRS was able to discriminate between these two forms of dementia. Patients with HD obtained lower Initiation and Attention subtest scores than did the DAT patients. Patients with DAT obtained lower memory subtest scores than did the HD patients. The

authors concluded that the DRS can be used to differentiate between DAT and HD in addition to the traditional function of assessing the overall degree of cognitive impairment.

Nussbaum, Goreczny, and Haddad (1995) investigated the validity of the DRS and the Dementia Behavioral Scale (DBS) with 19 patients with DAT, 27 elderly depressed without cognitive impairment, and 8 elderly depressed with cognitive impairment. The authors found that the decline of functional capacity in patients with DAT may be due to widespread cortical impairment. On the other hand, the decline of functional capacity of the elderly depressed may be due to frontal lobe impairment. The authors concluded that the DRS and DBS may be useful in determining the functional capacity of patients with DAT. The finding supported the previous research of Vitaliano, Breen, Albert, Russo, and Prinz (1984). Eighteen mildly impaired subjects with DAT, 16 moderately impaired subjects with DAT, and 23 control subjects were given the memory and attention items from the DRS and the Mini-Mental State Exam. The authors concluded that attention and memory deficits can predict functional competence in DAT patients.

Research has been conducted assessing the usefulness of the DRS in the evaluation of different populations. Das, Mishra, Davidson, and Naglieri (1995) examined the validity of the DRS in assessing dementia in the retarded population. One hundred adults with mental retardation were studied: 46 with Down Syndrome and 54 without Down Syndrome. The authors found that the DRS detected dementia in the Down Syndrome subjects at age 50 and above, and therefore concluded that the DRS is a valid instrument for clinical use in screening for dementia in the Down Syndrome population.

In addition to the DRS's use as a clinical instrument, has also been used in research. For example, Kirk and Kertesz (1991) used the DRS to diagnose DAT when studying the drawing impairment of persons diagnosed with DAT. Also, Jeste, Wragg, Salmon, Harris, and Thal (1992) used the DRS as a diagnostic and screening tool when studying the prevalence of delusions in DAT. The combined use of the DRS in the clinical setting and in research indicate the popularity of the instrument. Therefore, it is necessary to add to the growing body of evidence of the validity of the DRS.

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Appendix B

Raw Data

Raw Data

| Subject # | DRS Total Score | Vocabulary raw score | Block Design raw score |
|---|---|---|---|
| 01 | 113 | 24 | 18 |
| 02 | 079 | 10 | 06 |
| 03 | 114 | 14 | 02 |
| 04 | 037 | 01 | 00 |
| 05 | 055 | 07 | 00 |
| 06 | 097 | 32 | 08 |
| 07 | 098 | 04 | 00 |
| 08 | 094 | 27 | 00 |
| 09 | 091 | 33 | 04 |
| 10 | 082 | 08 | 09 |
| 11 | 078 | 26 | 04 |
| 12 | 110 | 39 | 12 |
| 13 | 076 | 09 | 03 |
| 14 | 084 | 13 | 05 |
| 15 | 074 | 17 | 00 |
| 16 | 102 | 14 | 07 |
| 17 | 106 | 25 | 04 |
| 18 | 056 | 15 | 00 |

# Appendix C

## Consent Form

# Consent Form

The Dementia Rating Scale is a brief cognitive measure used in the diagnosing and staging of Alzheimer's Disease. The purpose of this study is to provide evidence of the validity of this instrument, which will be of future benefit in the diagnosis and treatment of Alzheimer's Disease. This research is being conducted by a student at the Marshall University Graduate College. The testing will consist of evaluating memory, attention, concentration, and visual spatial skills and will take approximately one hour. No one will be identified by name; only the test scores will be used. Additionally, no information will be given out to anyone concerning an individual's performance.

Participant's name:_____

The above named person may participate in this study.

_____ _____

Signature of participant or guardian, when appropriate Date