To the Graduate Council:

I am submitting herewith a dissertation written by Howard Wheeler Rasey entitled, "Quantitative EEG Differences During the Administration of a Continuous Performance Task Among Adults With and Without Attention Deficit Hyperactivity Disorder". I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Psychology.

Joel F. Lubar, Major Professor

We have read this dissertation and recommend its acceptance:

Accepted for the Council:

Associate Vice Chancellor and Dean of the Graduate School

QUANTITATIVE EEG DIFFERENCES DURING THE ADMINISTRATION OF A CONTINUOUS PERFORMANCE TASK AMONG ADULTS WITH AND WITHOUT ATTENTION DEFICIT HYPERACTIVITY DISORDER

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Howard Wheeler Rasey

December 1998

Copyright © Howard Wheeler Rasey, 1998

All rights reserved

DEDICATION

This dissertation is dedicated to my parent Bob and Jeri Rasey. I am the person I am today as a result of the guidance and direction you have provided. You have shared in my triumphs, and helped me through my pitfalls. You have been a source of unwavering love, support, and understanding. I consider myself extremely fortunate to have had such a stable foundation on which to build. It would require volumes to express my gratitude for everything you have provided, and my love for you both is beyond measure.

ACKNOWLEDGMENTS

I would like to recognize Dr. Joel F. Lubar for his significant contribution to my graduate career. It has been through his influence as my major professor, and mentor, that I have taken the steps necessary to succeed. His support has always been consistent and his guidance sincere. He has provided direction, while still allowing me to find my own way. I am grateful to have had the experience of working with him over the past four years, and will remain ever thankful for all he has provided.

There are other individuals who truly deserve recognition for their influence in directing the success I have had while at Tennessee. Drs. Anne McIntyre, Deborah Baldwin, and Steve McCallum, who served on both my student advisory and doctoral committees, enabled the entire process to occur. Individually, they each possess a professionalism that should be recognized and emulated. Collectively, they provided the needed guidance and direction which are the cornerstones of all successful committees.

It is important to recognize the assistance of Dr. Bob Muenchen, for his expertise in the area of statistical analysis. His ability and willingness to explain complex ideas in understandable terms is truly commendable. I also thank Dr. Joseph Sandford who created the *Intermediate*

Visual and Auditory continuous performance test used in this study. His continued support of my research over the past four years is greatly appreciated.

I also wish to thank my closest friends, Francis Craig and Jeff Wincze. Throughout the time I have known them they have supported me when I needed support, understood me when I needed understanding, corrected me when I needed correction, and have helped me see things more clearly during times when they were unclear. Mostly, they have been my friends, and for this I am grateful.

Lastly, and most importantly, I wish to thank Melissa Rifkin, without whom I would be lost. Her care and understanding have become constants in my life. Constants that have helped me survive this process, and constants that I would not want to do without. She has made my life richer, and I can only trust that she understands what a significant part of my life she has become.

Abstract

The present study evaluated electroencephalographic (EEG) processing between adults with and without attention deficit hyperactivity disorder (ADHD) during the presentation of the Intermediate Visual and Auditory (IVA) Continuous Performance Test (CPT), and during an eyes-open and eyes-closed baseline. Cortical activity was compared within nine locations of the International 10-20 Placement System across three bandpasses: theta, alpha, and beta. Results suggested that adults with ADHD demonstrate an EEG pattern characterized by higher levels of theta activity and lower levels of beta activity during both cognitive and baseline tasks.

TABLE OF CONTENTS

CHAPTER PAGE

I. INTRODUCTION....1

II. CONTINUOUS PERFORMANCE TESTS....13
JUSTIFICATION FOR THE PRESENT STUDY....29
PURPOSE....30
STATEMENT OF DISSERTATION HYPOTHESES....30
Primary Hypotheses....31
Exploratory Analysis Hypothesis....31
CPT Performance Hypothesis....32

III. METHODS....33
SUBJECTS....33
Screening Measures....33
Wender Utah Rating Scale....33
Diagnostic Criteria for ADHD (DSM-IV)....34
Brown Attention Deficit Disorder Scale for Adults....35
Beck Depression Inventory....35
MATERIALS....36
PROCEDURE....37

IV. RESULTS....41
STATISTICAL ANALYSIS....41
RESULTS - SCREENING MEASURES....43
Significant t-tests: CPT - Visual Stimuli....44
Significant t-tests: Eyes-Open Baseline....44
Significant t-tests: Eyes-Closed Baseline....45
RESULTS - EXPLORATORY ANALYSIS....45
Significant t-tests: CPT - Visual Stimuli....46
Significant t-tests: CPT - Auditory Stimuli....48
Significant t-tests: Eyes-Open Baseline....48
Significant t-tests: Eyes-Closed Baseline....51
Correlations: CPT Performance Change Scores and Eyes-open Baseline Power Ratios....55

V. DISCUSSION....56

VI. SUMMARY AND CONCLUSIONS....68

REFERENCES.....72

APPENDICES.....82

VITA.....158

LIST OF TABLES

TABLE		PAGE
I-1.	Total ADHD PsychINFO References	1
I-2.	Total ADHD PsychINFO References	2
I-3.	Summary of Prospective Studies Supporting ADHD in Adulthood	6
A-1.	Differences in Group Demographics on Screening Measures	83
A-2.	Significant T-Tests: CPT - Visual Stimuli	84
A-3.	Significant T-Tests: CPT - Auditory Stimuli	85
A-4.	Significant T-Tests: Eyes-Open Baseline	86
A-5.	Significant T-Tests: Eyes-closed Baseline	87
A-6.	Correlations Between CPT Performance Change Scores and Eyes-open Baseline Ratios - ADHD	88
A-7.	Correlations Between CPT Performance Change Scores and Eyes-open Baseline Ratios - Controls	89
A-8.	ANOVA Tables	91

LIST OF FIGURES

FIGURE PAGE

1. Increases in theta activity for the ADHD group during the second omission section of the visual CPT.....47

2. Decreases in beta activity for the ADHD group during the first omission section of the auditory CPT.....49

3. Decreases in beta activity for the ADHD group during eyes-open baseline. Time period corresponds to the second commission section of the CPT.....50

4. Decreases in beta activity for the ADHD group during eyes-open baseline. Time period corresponds to the second omission section of the CPT.....52

5. Decreases in beta activity for the ADHD group during eyes-closed baseline. Time period corresponds to the first omission section of the CPT.....53

6. Decreases in beta activity for the ADHD group during eyes-closed baseline. Time period corresponds to the second omission section of the CPT.....54

LIST OF ABBREVIATIONS

ADD	Attention Deficit Disorder
ADHD	Attention Deficit Hyperactivity Disorder
ANOVA	Analysis of Variance
CPT	Continuous Performance Test
C3	Central Left
CZ	Central Midline
C4	Central Right
EEG	Electroencephalography
ERP	Event Related Potential
Fig.	Figure
F3	Frontal Left
FZ	Frontal Midline
F4	Frontal Right
Hz.	Hertz
M	Mean
Min.	Minute
PET	Positron Emission Tomography
P3	Posterior Left
PZ	Posterior Midline
P4	Posterior Right
QEEG	Quantitative Electroencephalography
SD	Standard Deviation
SPECT	Single Photon Emission Computed Tomography

Chapter I

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) has become one of the most studied and well known of the childhood behavior disorders (Weiss & Hichtman, 1993). First described by Still in 1902, the disorder was characterized as consisting of a cluster of behavioral problems including hyperactivity, learning difficulties, and poor attention (Barkley, 1990). Despite the recognition of a clear symptom cluster at the beginning of the 20th century, studies examining ADHD did not begin to significantly impact the field of childhood disorders until the mid 1980's.

The trend of increasing studies within the area of ADHD can be seen by evaluating published studies included in the PsycINFO database. PsycINFO contains a listing of articles and abstracts compiled by the American Psychological Association from information published in Psychological Abstracts and the PsycINFO database. Beginning with the publication year 1980, the total number of references including ADHD within the database over the past 17 1/2 years is presented in Table I-1.

Table I-1. Total ADHD PsycINFO References

Years	References
1980 - 1884	44
1985 - 1989	303
1990 - 1994	1056
1995 - 1998 (3.5 yrs.)	1188

An area that has not received much attention within the ADHD literature, however, is the adult form of the disorder. Looking across the same period of years, the PsycINFO database includes significantly fewer ADHD references which include information about adults (Table I-2).

Table I-2. Total ADHD PsycINFO References

Years	Total ADHD References	Total References Including Adults
1980 - 1884	44	0
1985 - 1989	303	11
1990 - 1994	1056	45
1995 - 1998 (3.5 yrs.)	1188	86

While the survey method used for these examples is in no way intended to represent a comprehensive compilation of all articles on the subject, the information contained in the tables remains useful. The references clearly indicate that a very small percentage of the total articles published on the subject of ADHD include information about the adult form of the disorder.

At first examination of this information, the general lack of studies including adults may appear justified. ADHD has traditionally been classified as a childhood disorder, and is included in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)(American Psychiatric Association, 1994) within the section of disorders that are first evident

deficits which included learning disabilities and a tendency toward antisocial behavior.

Specific prospective studies which demonstrate the presence of ADHD symptoms persisting into adulthood are presented in Table I-3. In general, this table demonstrates that a significant number of adults who were diagnosed as ADHD in childhood, continue to have difficulties in areas of academic and vocational achievement. They also have increased negative interactions with law enforcement, and an increased tendency to develop personality and substance abuse disorders. In a review of prospective studies which maintained good control over problems inherent in conducting prospective research (i.e. attrition, small sample size, lack of control, age and length of follow-up), Goldstein (1997) concluded that at least 70% of children diagnosed with ADHD will continue to show problems into young adulthood.

This being said, the specific percentages of children diagnosed with ADHD, who can expect to have continued difficulty into adulthood, remains controversial. Estimates have ranged from lows of 10% (Schaffer, 1994), highs of 79% (Weinstein, 1994), and average estimates somewhere between 30-50% (Barkley, 1997; Sears & Thompson, 1997).

The discrepancy between the above estimates, and the continued discrepancy among various prevalence estimates of

Table I-3. Summary of Prospective Studies Supporting ADHD in Adulthood.

Author(s)	N	Beginning Age Range	Years to Follow-up	Primary Results
Weiss, Hechtman, & Perlman (1978)	104	6 - 12	15	more court referrals, had tried more nonmedcal drugs, showed pattern of impulsive and immature behavior
Hechtman, Weiss, Perlwell, Hopkins, & Wener (1979)	104	6 - 12	15	not achieving as well vocationally
Weiss, Hechtman, Milroy, & Perlman (1985)	104	6 - 12	15	66% of sample had least one symptom of ADHD; 23% diagnosed with antisocial personality disorder
Weiss, & Hechtman (1986)	104	6 - 12	15	more frequent suicide attempts, moved more often, failed more grades more car accidents, lower academic achievement
Gittelman, Mannuzza, Shenker, & Bonagura (1985)	101	9.3 (M)	9 (M)	1/3 maintained full ADHD diagnostic profile, increased conduct disorder, increased substance abuse
Barkley, Guevremont, Anastopoulos, DuPaul, & Shelton (1993)	35	16 - 22	3 - 5	less sound driving records, increased autoaccidents, increased traffic tickets, increased license suspentions

Table I-3. (continued).

Author(s)	N	Beginning Age Range	Years to Follow-up	Primary Results
Mannuzza, Gittelman-Klein, Bessler, Malloy, & LaPadula (1993)	91	9.3 (M)	17 (M)	completed less formal education, lower occupational rank, increased frequency of antisocial personality disorder
Achenbach, Howell, McConaughy, & Stanger (1995)		13 - 19	19 - 22	continued aggressive behavior which is less overt in nature
Scatterfield & Schell (1997)	89	6 - 12	13 - 21	increased juvenile and adult arrests, increased juvenile and adult incarceration rates
Mannuzza, Klein, Bessler, Malloy, & Hynes (1997)	85	7.3 (M)	15 - 21	completed less formal education, lower ranking occupational positions
Mannuzza, Klein, Bessler, Malloy, & LaPaula (1998)	85	7.3 (M)	15 - 21	increased antisocial personality disorder, increased nonalcohol substance abuse

adult ADHD, which have varied between 1% and 20% (Jackson & Farrugia, 1997), represent a primary controversy within the field. As described by Barkley (1997), the problems which exist when making estimates, are partly due to inconsistent diagnostic criteria and their use in accurately measuring the symptoms associated with the disorder. An example demonstrating this point involves those adults who were not diagnosed as ADHD in childhood, but demonstrate difficulties in adulthood.

Based upon the DSM-IV (American Psychiatric Association, 1994) criteria for ADHD diagnosis, an individual must have experienced hyperactive-impulsive or inattentive symptoms, to a level indicating impairment, before the age of seven. As stated above, this criteria is consistent with the inclusion of ADHD within disorders that are first evident in childhood. This criteria, however, is inconsistent with research findings showing that some adults who experience symptoms of ADHD were not diagnosed as children (Gualitieri, Ondrusek, & Finley, 1985).

In a study of 60 adults who had symptoms of ADHD, but were not diagnosed during childhood, Ratey, Greenberg, Bemporad, and Lindem (1992), reported this group as experiencing mental and physical restlessness, impulsivity, distractibility, low self-esteem, and a sense of underachievement. In addition, this group had significant

learning and behavior problems. These researchers concluded that individuals not diagnosed as children may have atypical symptoms, and may have developed skills which helped them compensate for their attention deficit.

This conclusion was consistent with earlier comments made by Ratey (1991), that adults who were not diagnosed as having ADHD in childhood tended to exhibit less severe symptoms and have less obvious areas of dysfunction. It was additionally hypothesized that higher intelligence and socioeconomic status may have prevented a childhood diagnosis.

Other researchers have also found differences between adults who were diagnosed with ADHD in childhood and those who were not. Dividing a total sample of 143 adults who presented for ADHD into three groups, Roy-Byrne, Scheele, Brinkley, & Ward (1997), found that patients who presented with ADHD-like symptoms, but did not have a childhood history of the disorder, had higher rates of current substance abuse than those with childhood diagnosis.

Another difficulty within the adult ADHD population, which not only leads to discrepancies in prevalence estimates, but also causes significant problems with diagnosis and assessment, is the presence of comorbidity. With ADHD often being described has having greater comorbid disorders than any other single disorder (Goldstein &

Goldstein, 1990), an accurate diagnosis of adult ADHD becomes extremely difficult (Goldstein, 1997).

Much of the difficulty in accurate diagnosis is related to the fact that the primary symptoms of ADHD, inattention and hyperactivity-impulsivity, also occur in a wide range of childhood and adult disorders. These include personality and anxiety disorders, depression, and are an aspect of many medical problems such as abuse and closed head injury (Goldstein, 1997).

Evaluating a total of 70 adults, Ratey (1991) found that 40% of the clinical sample presented with a mood disorder (depression, dysthymia, or bipolar) along with ADHD. Additionally, a small percentage of these individuals presented with antisocial personality disorder. The majority of the sample described experiencing interpersonal problems and difficulties with academic underachievement.

Within individuals presenting for treatment of ADHD in a clinic setting, two reports by Shekim (1990), and Shekim, Antun, Hanna, McCracken and Hess (1990), have indicated that adults with ADHD frequently experience additional difficulty with anxiety and depression. Overall, these researchers found that approximately 50% of their clients also experience major chronic depression, alcohol, or drug abuse problems, which leads to their conclusion that ADHD rarely occurs alone.

Murphy and Barkley (1996), compared 172 adults diagnosed with ADHD with 30 adults not diagnosed, and found that ADHD adults presented with a greater prevalence of oppositional and conduct disorders, along with increased amounts of substance abuse. Those with ADHD also reported experiencing greater psychological maladjustment, as well as anxiety and mood disturbances. Similarly, Downey, Stelson, Pomerleau, and Giordani (1997), found high comorbidity with current depressive disorder, antisocial personality disorder, alcohol and drug abuse, and dependence when evaluating 78 outpatients admitted to an ADHD clinic.

Due to the inherent difficulty of making an accurate diagnosis, the most effective approach to diagnosing adults with ADHD involves obtaining information from a number of sources (i.e., parents, significant others, teachers), and using a variety of measures. An important aspect in any diagnostic investigation is the use of questionnaires, both for the evaluation of current functioning and past history. These measures often confirm the presence of specific symptoms and express the consistency within these findings from numerous individuals. However, with the use of subjective measures, bias may play a role. Parents traditionally underrate the presence of a disorder within a sibling, while teachers often overrate ADHD symptoms in students, with the goal of receiving treatment/services to

help correct a child's disruptive classroom behavior (Barkley, 1990).

As a result of the subjective nature of questionnaires and the use of clinical histories where past information may have been forgotten, the use of laboratory tests and observational measures to assess individuals suspected of having ADHD have shown tremendous growth (Barkley, 1990; Greene & Barkley, 1995). The Continuous Performance Test (CPT) has led the way within this area, becoming the most widely used laboratory measure in studies evaluating the various aspects of ADHD (Barkley, 1991; Corkum & Siegel, 1993; Gordon, 1983). The CPT, though a useful clinical measure of attention, is not without its faults. Paramount among the faults is the reported 15 to 35% false-negative rate, which is the occurrence of ADHD individuals diagnosed with the disorder who score normal on the test (Sears & Thompson, 1998; Trommer, Hoeppner, Lorber, & Armstrong, 1988).

The inconsistencies that occur in laboratory evaluations, questionnaires, and personal histories, combined with the inherent difficulties of comorbidity, imply that research designed to develop new diagnostic methods need to be explored. The goal of these methods should be to help define and describe the adult form of ADHD.

Chapter II

CONTINUOUS PERFORMANCE TESTS

The development of the first Continuous Performance Test (CPT), by Rosvold and colleagues (Rosvold, Mirsky, Sarason, Bransome, & Beck, 1956) was driven by two findings. First, based on earlier findings within the brain-damaged population, Rosvold et al., summarized that due to differences in electroencephalographic (EEG) patterns (high amplitude hypersynchronous activity which intrudes normal waking activity), individuals with brain damage should show differences on tests assessing sustained performance. Second, it was hoped that a CPT would replace the standard tests of attention at that time (e.g. digit span and digit symbol of the Wechsler-Bellevue) which had difficulty discriminating brain-damaged from normal individuals.

Rosvold et al., (1956) theorized that a test which would both control for time allowed for responding and which would require high sustained attention over time should produce scores with discriminating ability. Thus, the CPT was created to provide two separate attention tests: the 'X-test" and the 'A-X-test'. Task demands for the X-test required subjects to make a lever response every time the letter 'X' appeared within a small viewer, and refrain from responding if any other letter appeared. The A-X test

required subjects to make a lever response every time the letter 'X' was preceded by the letter 'A', and refrain from responding to any other 'A-letter' combination. Using brain-damaged and non-brain-damaged subjects, the researchers found significant discrimanant ability between the two groups on the mean number and standard deviation of correct responses. The finding that the CPT adequately discriminated subject populations based upon levels of attention or alertness opened the door to subsequent studies which evaluated the effects of lesioning (Rosvold, Szwarcbart, Mirsky, & Mishkin, 1961) and the comparison of drug effects (Primac, Mirsky, & Rosvold, 1957).

Through the demonstration of using CPTs as discriminating patient types, the test began to be used with greater frequency and with more diverse populations (Gordon, 1983). Within the field of ADHD, however, it was not until the mid 1970's that vigilance tests were first used to assess the components of this disorder. Following research conducted in the 1970's, it was repeatedly demonstrated that hyperactive children had their greatest difficulties on tasks assessing vigilance or sustained attention (Barkley, 1990). The CPT, having been developed as a measure of sustained attention, seemed a logical choice for this population. It was necessary however, to analyze performance beyond mean number and standard deviation of

responses and turn to an evaluation of specific error types. The CPT generates two distinct types of errors: errors of commission and errors of omission. The commission error is defined as making a response to a non-target, while omission errors are the failure to make a response to a target. The usefulness of using error types for analysis is their relationship with the primary symptoms of ADHD. Commission errors are correlated with measures of hyperactivity and impulsivity, while ommission errors are correlated with measures of poor sustained attention (inattention) (Sandford & Turner, 1993). Partly due to studies which have consistently demonstrated that ADHD children produce greater errors of commission and omission (Barkley, Grodzinsky, & DuPaul, 1992; Grodzinsky & Diamond, 1992; Corkum & Siegel, 1993; Losier, McGrath, & Klein, 1996), and Gordon's (1983), commercially available CPT, the measure has become the most widely used laboratory measure in studies evaluating the various aspects of ADHD (Barkley, 1991; Corkum & Siegel, 1993; Gordon, 1983).

Much of the success of the CPT as a laboratory measure has been due to its reliability in discriminating ADHD from non-ADHD groups and its sensitivity to medication effects (Barkley, DuPaul, & McMurray, 1990b; Douglas, 1983; Gordon & Mettelman, 1988). The CPT has also been shown to measure developmental effects within children born prematurely

(Katz, Dubowitz, Henderson, Jongmans, Kay, Nolte, & de-Vries, 1996) and the attentional effects following pediatric closed head injury (Kaufmann, Fletcher, Levin, Miner, & Ewing, 1993).

Another important development in the use of CPTs as a clinical measure of attention came from the use of factor analytic approaches which saught to categorize attention into its component elements. Proposing a four factor model of attention, Mirsky (1987, 1989) demonstrated significant factor loadings for the total number of correct responses on the CPT and the vigilance factor (Factor III). Specifically, he proposed that the total number of correct responses related to the sustained attention element of the vigilance factor. To a lesser extent, there were additional loadings for the total number of commission errors, and reaction time for the vigilance factor.

Additional evidence of the role of the CPT in factor models assessing attention came from two studies which used boys with attention deficit hyperactivity disorder (ADHD). Grodzinsky and Diamond's study (1992), demonstrated that both of the error types generated by the CPT, commissions and omissions, loaded on Dimension V of their model. This dimension, made up exclusively of the two CPT error patterns, appears to represent difficulties with impulsivity and inattention (Barkley, 1997b). A second factor analytic

study conducted by Mariani and Barkley using boys with ADHD (1997), demonstrated factor loadings between CPT correct responses and motor control (Factor I), correct responses and working memory (Factor IV), and also negative correlations for commission errors and working memory. The utility of these factor analytic models provided two lines of evidence which supported the use of CPTs as a laboratory measure. First, they consistently proposed specific domains in which elements of the CPT can be classified. Second, findings which relate performance to vigilance, motor control, and working memory suggest that the source of the errors made are related to difficulties in sustained attention.

In contrast, the notion that differences in sustained attention are responsible for decrements in CPT performance however, has been challenged by Barkley (1997). Using a different approach to interpreting the generation of commission and omission errors, Barkley has proposed that such errors may not reflect difficulties in sustained attention, but rather indicate difficulties in a subject's ability to adhere to verbal instructions. Specifically, the instructions to perform a simple, boring, unreinforcing task over a prolonged period of time. The errors generated by the CPT, may reflect the capacity of an individual to sustain motivation to a task in the absence of external

sources of motivation. Citing a specific example, Barkley applies this critique in questioning the interpretation within Mirsky's (1987, 1989) model of attention. As stated above, this model proposes that CPT scores reflect the sustained attention element within the vigilance factor. Applying a parallel between the Wisconsin Card Sorting Task (WCST) and CPT performance, Barkley discusses that both reflect difficulties in sustained compliance to a rule for an extended period of time, rather than sustained attention.

Barkley (1997b) also states that poor performance on the CPT may also represent difficulties in interference control. Evidence for this interpretation comes from studies of college students that were interrupted during the presentation of the CPT and asked what they were currently thinking about. Subjects with ADHD reported greater amounts of task-irrelevant thoughts (Shaw & Giambra, 1993). The implication is that poor control over internal sources of distraction may be the cause for poorer performance.

Barkley's points concerning the interpretation of CPT performance, while indicating basic differences within the adherence to a particular model of attention, represent a more fundamental problem. If our goal is to understand the difference in CPT performance between individuals with and without ADHD, it may be necessary to focus evaluations toward biological explanations and away from theoretical

models. Evaluations of the biological aspects of the CPT should yield answers to two questions: what are the biological correlates of CPT performance, and do these help explain the differences between ADHD and normal subjects?

The first biological evaluations of CPTs, possibly guided by Rosvold's original explanation for the development of the test for brain-damaged individuals, were within the area of cortical activity. Haider, Spong, and Lindsley (1964) and Haider (1967), evaluated evoked potential recordings while subjects performed vigilance tasks and tasks requiring selective attention, expectation, and anticipation. Changes in vigilance performance were accompanied by changes in P300 ERPs. Specifically for missed targets, the ERPs contained a lower amplitude than detected signals. During selective attention tasks, larger responses occurred when attention was directed toward, rather than away from the stimuli. Through the evaluation of performance during tasks which evaluated expectation, the researchers discovered the presence of an "expectancy potential", when stimuli were expected, but did not occur. This potential, which was labeled an H-priming effect, can be thought of as an increase in cortical activity, which has the purpose of preparing those cortical structures which will actually make the response. A similar occurrence was found if the stimulus occurred earlier than expected, rather

than not occurring. In this condition, the prominent N100 of the ERP occurred later, suggesting a continuation of cortical activity beyond that found during traditional responding.

The above finding of differences between responding and non-responding have been confirmed by researchers evaluating the cortical aspects of the CPT using 21-channel-ERPs (Fallgatter, Brandeis, & Strik, 1997). Explaining the basic components of the CPT as involving either the execution (Go) or the inhibition (No-Go) of a prepared motor response, these researchers demonstrated significant differences between the Go and No-Go responses. For the No-Go response (non-responding) ERPs occurred in the more anterior locations when compared to the Go response (responding). Interestingly, the anterior ERP response pattern occurred in every subject that was used in the study.

While the above studies were performed using normal subjects, ERP differences during the presentation of a CPT have also been shown in evaluations of schizophrenic patients (Pass, Klorman, Salzman, Klein, & Kaskey, 1980; Shelley, Grochowski, Lieberman, & Javitt, 1996), autistics (Strandburg, Marsh, Brown, Asarnow, Guthrie, & Higa, 1993), and individuals with attention deficit hyperactivity disorder (Verbaten, Overtoom, Koelega, Swaab-Barneveld, van-der-Gaag, Buitelaar, & van-Engeland, 1994).

Additional evidence suggesting a biological explanation came from studies using volumetric measurements of prefrontal and basal ganglia structures. Comparing ADHD boys and matched controls, it was found that both the caudate nucleus and globus pallidus were significantly smaller in ADHD boys (Castellanos, Giedd, Eckburg, Marsh, Vaituzis, Kaysen, Hamburger, & Rapoport, 1994; Castellanos, Giedd, Marsh, Hamburger, Vaituzis, Dickstein, Sarfatti, Vauss, Snell, Lange, Kaysen, Krain, Ritchhie, Rajapakse, & Rapoport, 1996). In addition, these differences were predominantly in the right hemisphere. These researchers also evaluated the role of these structural differences during a response execution task similar to the CPT. Using tests designed to evaluate commission and omission errors, the anatomic results showed that faster mean reaction times were negatively correlated with greater caudate symmetry and there was a significant negative correlation between right prefrontal volume and mean accuracy for ADHD subjects. In addition, there was a positive correlation between left globus pallidus volume and mean reaction time for controls, but not for boys with ADHD. The combination of these results suggest an anatomical relationship within the caudate nucleus and globus pallidus for the poor performance seen in ADHD subjects during CPT-like tests.

While the ERP studies demonstrated a differential activation during target presentation and the structural evidence supported difficulty within frontal structures, further investigations evaluated the functional activation of the frontal lobe during the CPT. Two lines of evidence are consistent with a biological model of CPT performance decrements that include the role of frontal activation. Using near-infrared spectroscopy, Fallgatter & Strik (1997) evaluated brain oxygenation for left and right anterior frontal brain areas during CPT performance. Results indicated changes in deoxyhemoglobin, but not in oxyhemoglobin, in right frontal brain areas when compared to baseline. Results support the view that execution of the CPT is associated with prevalently right frontal activation.

Additional evaluations of the functional role of frontal structures during a CPT, include a study by Rezai, Andreasen, Alliger, Cohen, Swayze, & O'Leary (1993). These researchers used single photon emission computed topography (SPECT) to compare activation of regional blood flow in frontal brain locations for four neuropsychological tests. These included the CPT, the Wisconsin Card Sort, the Tower of London, and the Porteus Mazes. The CPT and Wisconsin Card Sort both showed significant increases in frontal regions. The CPT demonstrated specific increases in the mesial, bilateral, and midline attentional circuits, while

the Wisconsin Card Sort demonstrated specific increases in the left dorsolateral area of the prefrontal cortex. These researchers concluded that regional activation of the frontal lobes occurs in response to cognitive challenges produced through performance of standard neuropsychological tests.

Exploring specific aspects of the cortical EEG, Daniel (1967), evaluated alpha and theta activity during a 1-hour vigilance task. Results demonstrated that as the test progressed, there were significant increases in alpha (8-12 Hz.) activity. This activity paralleled the gradual deterioration in behavioral performance of the subjects. Daniel discussed these results in terms of a gradual loss of alertness in cases where stimuli are repetitive, monotonous, and unrelieved. The study also suggested that subjects experienced a fluctuation in their theta activity over the course of the test. Examining these fluctuations in relation to presented stimuli, it was discovered that if a particular stimulus happened to occur when theta power was high, indicating greater inattentive activity, there was a corresponding lower probability of detection.

Beatty, Greenberg, Deibler, and O'Hanlon (1974) studied the effects of learned regulation of theta (3-7 Hz.) activity on performance during a prolonged monitoring task. The research hypothesis stated that suppression of occipital

theta should cause subjects to maintain performance, while increases in theta should result in poorer performance. Twelve subjects were trained to suppress theta over the left occipital and parietal cortices while seven subjects were trained to increase their level of theta. The vigilance performance of subjects trained to increase theta dropped consistently over the testing period. Conversely, the vigilance performance of subjects trained to suppress theta, increased over the course of the monitoring task, with the greatest improvements occurring during the last segment of the test. The implication of this study was that EEG theta appears to have a regulatory component over an individual's level of vigilance, with greater theta indicating poorer vigilance.

In a replication of their 1974 study, Beatty and O'Hanlon (1980) demonstrated that the regulation of theta activity and its implication for improved performance was consistent over repeated sessions, using three groups of subjects: a theta-suppress group, a theta-enhance group, and a control group. The theta-suppress group consistently demonstrated lower theta ratios, again indicating greater vigilance during all six, 1-hour vigilance tasks.

These results were also consistent with predictions made by Gale (1977), regarding vigilance performance and theta production. Based upon the results of his studies, he

suggested that individuals who performed poorer on vigilance tasks, consistently demonstrated increased amounts of theta activity.

Exploration of the role of EEG activity during the CPT by Valentino and Dufresne (1991) assessed the level of alpha and beta hemispheric asymmetry during intake and rejection sections of attention tasks. While their results indicated slightly higher absolute power during the rejection task, the conclusions stated by the researchers are noteworthy. The study demonstrated consistent EEG responses within normal individuals during attention tasks. This finding further led the researchers to propose that the use of EEG recordings during the completion of attention tasks may lead to clinical applications. The suggestion that various clinical populations could be objectively contrasted could prove useful in diagnosis. The researchers also suggest that the CPT could prove particularly useful since the patient's involvement in the task can be evaluated by monitoring performance.

In a continuation of their own work, Valentino, Arruda and Gold (1993) evaluated EEG differences during an auditory CPT between subjects placed in either a high or low vigilance group. When compared to baseline recordings, both subject groups demonstrated higher beta, lower alpha, and lower theta activity during the test. Across the time

course of the CPT however, those within the low vigilance group had significantly lower beta activity. This implies that changes in beta activity were the best indicator of performance changes. As was concluded in the previous study, the researchers suggested the utility of combining EEG recordings with CPTs. Of particular interest in this study was the finding that significant changes within the EEG were associated with changes in attention as measured by poorer performance. Further, the researchers discussed that the overall purpose of the study was to continue the development of tasks which can be performed during physiological monitoring. Finding that the CPT combined with EEG recordings represents a testing condition with established reliability, the researchers concluded by suggesting the application of these techniques to distinguishing clinical populations.

The clear indication of difficulties experienced by ADHD subjects when completing CPTs warrants an evaluation of the EEGs of this population. Differences between the EEGs of individuals with and without ADHD have been reported as far back as 1938 with the work of Jasper, Solomon, and Bradley (1938). Reviewing the literature on the association between EEG and ADHD, Lubar (1995) summarizes the basic findings as indicating excessive slow-wave activity in central and frontal regions of the brain. Studies

evaluating the viability of these findings through the use of positron emission tomography (PET) and (SPECT), have consistently supported EEG differences between ADHD and normal subjects (Amen & Carmichael, 1997; Amen, Paldi, & Thisted, 1993). These studies have also indicated that for those individuals who experience slower activity in frontal regions, differences can be explained as indicating decreased metabolism in these regions.

Studies evaluating EEG activity during the performance of cognitive tasks have also shown differences between ADHD and normals. Mann, Lubar, Zimmerman, Miller, and Muenchen (1991) investigated topographic brain mapping for use as a diagnostic technique. They found that the significant increases in theta activity and decreases in beta activity, between ADHD and normal subjects, were greatest during conditions of reading and copying figures. Supporting the prior conclusions, increases in theta were most apparent in frontal regions.

The connection between increased slow activity and cognitive performance of individuals with ADHD was also found by Crawford and Barabasz (1996), when evaluating cortical activity during listening and arithmetic tasks. These researchers found an inverse relationship between alpha activation and cognitive activity, suggesting that

individuals with ADHD do not become cognitively activated during tasks requiring greater cortical activity.

The retention of EEG differences between ADHD and normal subjects into adulthood however, has not been consistently supported. In a study of 47 hyperactive children, initially diagnosed as having mild diffuse slowing in their EEGs, and 27 normal controls, Weiss & Hechtman (1993), reported no significant differences between their EEGs, at a 10-year follow-up. The authors discuss the results as indicating that abnormal EEGs in hyperactive children tend to normalize with age.

One problematic aspect of this study, however, is that at follow-up the researchers reported 26 of the 37 hyperactive subjects, and 18 of the 27 control subjects, as having normal EEGs. Applying Chi Square analysis, the researchers found no significant differences between groups. Evaluating the percentage changes within the two groups, approximately 70% of the hyperactive group no longer exhibited abnormal EEGs, while 66% of the normal group no longer had abnormalities. Statistically, these differences were non-significant, but a question arises, as to why the normal group developed abnormal EEGs. Interestingly, when evaluating the outcome of the study from the point of view that 30% of the hyperactive subjects continued to demonstrate EEG abnormalities at 10-year follow-up, studies

are supported which conclude that approximately 30-50% of children with ADHD will continue to experience difficulties into adulthood.

JUSTIFICATION FOR THE PRESENT STUDY

From the above review, it is clear that the evaluation of EEG recordings during the presentation of a CPT, is justified for individuals with ADHD. Reviewing the specific points of this argument:

1. The CPT has been used to effectively discriminate between ADHD and normal subjects.
2. CPT performance has been linked to biological processes, which account for some of the differences in performance.
3. EEG data taken during vigilance tasks and CPTs have demonstrated that increases in alpha and theta activity and decreases in beta activity, are related to poorer performance.
4. Individuals with ADHD have been shown to have higher levels of alpha and theta activity, and lower levels of beta activity compared to normals.
5. The cortical areas most sensitive to the differences between ADHD and normal individuals are within the frontal regions of the cortex.

Taken together, these points suggest that, when compared to normals, individuals with ADHD should demonstrate increased levels of alpha and theta activity, along with decreased levels of beta activity during CPT performance.

PURPOSE

The purpose of the present study was to evaluate electroencephalographic (EEG) processing between adults with and without attention deficit hyperactivity disorder (ADHD) during the presentation of the Intermediate Visual and Auditory (IVA) Continuous Performance Test (CPT), and during an eyes-open and eyes-closed baseline. Cortical activity was initially compared during the final section of each condition at location FZ of the International 10-20 Placement System (Jasper, 1958). In a subsequent exploratory analysis, processing within eight additional locations was compared during all four sections of each condition. Activity was evaluated across three bandpasses: theta, alpha, and beta.

STATEMENT OF DISSERTATION HYPOTHESES

The following hypotheses were tested in this dissertation:

Primary Hypotheses.

1. During the final section of the visual continous performance task, adults with ADHD will demonstrate higher theta and alpha activity, and lower beta activity at location FZ when compared to non-ADHD controls.

2. During the final section of the auditory continous performance task, adults with ADHD will demonstrate higher theta and alpha activity, and lower beta activity at location FZ when compared to non-ADHD controls.

3. During the final 1:18 of the 13 minute eyes-open baseline condition, adults with ADHD will demonstrate higher theta and alpha activity, and lower beta activity at location FZ when compared to non-ADHD controls.

4. During the final 1:18 of the 13 minute eyes-closed baseline condition, adults with ADHD will demonstrate higher theta and alpha activity, and lower beta activity at location FZ when compared to non-ADHD controls.

Exploratory Analysis Hypothesis.

5. When compared accross nine cortical locations, adults with ADHD will demonstrate higher theta and alpha activity, and lower beta activity when compared to non-ADHD controls. This pattern of activity will be evident during the visual

and auditory continuous performance tasks, and during the eyes-open and eyes-closed baselines.

CPT Performance Hypothesis.

7. Poorer performance on the visual and auditory CPTs, as measured by changes in response time, will be positively correlated with higher alpha/beta and theta/beta power ratios.

Chapter III

METHODS

SUBJECTS

A total of 40 male subjects (ages 18-25; mean=21.25) from the undergraduate population at the University of Tennessee, Knoxville were recruited as participants for the study. The subjects represented two separate sub-groups (N=20), based upon the presence or absence of attention deficit hyperactivity disorder (ADHD). Prior to participation in any aspect of the study, all subjects completed an informed consent form approved by the University of Tennessee, Internal Review Board. Following informed consent, all subjects completed the following screening measures to assure presence or absence of ADHD: The Wender Utah Rating Scale (Wender, 1995), the diagnostic criteria for ADHD from the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV,), (American Psychiatric Association, 1994), the Brown Attention Deficit Disorder Scale for Adults (Brown, 1996), and the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961).

Screening Measures.

Wender Utah Rating Scale. The Wender Utah Rating Scale (Wender, 1995) is a 61-item self-rated likert scale used to

evaluate adults with attention deficit hyperactivity disorder. For each item on the scale, five different responses are possible with a numerical value attached to each response (Not at all = 0; Mildly = 1; Moderately = 2; Quite a bit = 3; Very much = 4). The scale is based on childhood presence of ADHD and evaluates general symptoms associated with the disorder, medical conditions and school performance. Comparing male adults with and without ADHD on 25 of the 61 items believed most representative of the disorder, those with ADHD achieved a mean score of 60.3 (SD=14.2), while those without ADHD achieved a mean score of 17.9 (SD=11.0).

Diagnostic Criteria for ADHD, (DSM-IV). The diagnostic criteria for ADHD from the DSM-IV, (American Psychiatric Association, 1994), requires an individual to experience six of nine specified symptoms for a diagnosis of ''predominantly inattentive type'' or experience six of nine other specified symptoms for a diagnosis of ''predominantly hyperactivity-impulsive type''. If an individual is experiencing at least six symptoms from each category, they are diagnosed as having a ''combined type'' of ADHD. As mentioned previously in the review, the DSM-IV also requires that for the diagnosis of ADHD, adults must have experienced symptoms for at least six months, that these symptoms must have been significant enough to cause impairment before the

age of seven, that impairment must be occurring across two or more settings with clear difficulty in social, academic, and occupational functioning, and that symptoms must not be occurring due to another psychotic or mental disorder.

Brown Attention Deficit Disorder Scale for Adults. The Brown Attention Deficit Disorder Scale for Adults (Brown, 1996) is a 40-item self-report scale designed to measure symptoms of attention deficit disorder for adults 18 years and above. The items are grouped into five clusters of related symptoms including organizing and activating to work, sustaining attention and concentration, sustaining energy and effort, managing affective interference, and utilizing ''working memory'' and accessing recall. In a comparison of subjects with and without ADHD, those with ADHD achieved a mean score of 77.9 (SD=16.3), while those without ADHD achieved a mean score of 30.9 (SD=15.8).

Beck Depression Inventory. The Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a 22-item self-report scale used to assess degrees of sadness and depression. Each of the items has four possible responses ranging from '0' to '3'. The BDI is the most widely used measure of depression in adults (Barkley, 1990) and was included in the present study to screen for comorbidity of depression among subject groups.

The above screening measures were used to confirm that subjects in the ADHD group demonstrated clear characteristics of the disorder, and to assure that subjects in the control group did not demonstrate ADHD characteristics. In addition to these measures, subjects within the ADHD group were required to be receiving services from the Office of Disability Services at the University of Tennessee, Knoxville, or to currently be under the care of a psychiatrist or physician for the treatment of attention deficit hyperactivity disorder.

MATERIALS

All subjects were administered the Intermediate Visual and Auditory (IVA) Continuous Performance Test (CPT) (Sandford & Turner, 1994). The IVA is an integrated 13 minute CPT which combines visual and auditory modalities. The test requires subjects to click a computer mouse when they see or hear the number "1" (target) and refrain from clicking the mouse when they see or hear the number "2" (foil). The target and foil stimuli are presented in a "pseudo-random" pattern combining both visual and auditory components. The test is divided into five two-section parts yielding a total of 10 individual sections. The odd sections utilize a target-to-foil ratio of 5.25 to 1, thus creating a testing situation that is more sensitive to

errors of commission. The even sections utilize a target-to-foil ratio of 1 to 5.25, thus creating a testing situation that is more sensitive to errors of omission. For the purpose of this investigation, the IVA will be administered two times so that the visual and auditory components may be assessed separately. In addition, only sections 1, 2, 9, and 10 will be used for analysis. These individual sections will allow for a comparison of cortical activity at the beginning of the test with activity during the final sections of test. This comparison will be made for sections where errors of commission are more likely (sections 1 and 9), and where errors of ommission are more likely (sections 2 and 10).

PROCEDURE

All subjects completed four quantitative electro-encephalograph (QEEG) recordings during four different task conditions. The conditions included: a 13-minute eyes-open baseline, a 13-minute eyes-closed baseline, the visual component of the IVA, and the auditory component of the IVA. These recordings were conducted on two separate days with at least one week between recordings. The eyes-open baseline and the visual component of the IVA were run during the same session, with the eyes-closed baseline and the auditory component of the IVA run during the other session.

The quantitative referential EEG (QEEG) was recorded from 19 electrodes following the International 10-20 Placement System (Jasper, 1958), with linked earlobe references. All electrode impedances were maintained at or below 5 KOhms. Recordings were made using an electrode cap (Electro Cap Inc.). Raw EEG was fed through 19 matched 7P511 pre-amplifiers (Grass Instrument Co.), with bandpass filters set to 0.5-100 Hz. A BMSI 12-bit A to D converter digitized the output of the amplifiers. Rhythm software (Stellate Systems) was employed to record the raw EEG. The sampling rate was set at 128 samples per second. Under Rhythm software, when a sampling rate of 128 is specified, the actual rate employed is oversampled at 256 samples per second with each digitized point replaced by a weighted sum of its neighbors; every other point of this filtered data is written to disk as a 16 bit value. This sampling rate allows for analysis from 1 - 32 Hz. according to the base Nyquist frequency which states the highest frequency of analysis is less than or equal to 1/4 of the sampling rate (Kellaway, 1976). Signal aliasing was eliminated by the use of a 16 point FIR (finite impulse response) filter, with a sharp low pass cutoff set at 64 Hz. and higher.

All recordings took place in a 50 square foot (5 X 10 ft.) sound attenuated experimental room. Subjects were seated in a standard desk chair and were the only person in

the room. For the eyes-open baseline, subjects were asked to gaze at a 13 inch computer monitor, adjusted to eye-level, approximately three feet in front of them. They were instructed to remain as still as possible and to limit the total number of eye-blinks during the thirteen minute recording session. For the eyes-closed baseline, subjects wore a standard sleeping mask to reduce any light artifact which may have been perceived through closed eye-lids. Subjects were again asked to remain as still as possible during the recording session which was also thirteen minutes in duration.

For recordings during the IVA, subjects faced a 14 inch computer monitor, adjusted to eye-level, approximately three feet in front of them. A portable height-adjustable table was used for the placement of a computer mouse which was used to make responses during the CPT. The table was placed to the left or right of the subject depending upon which hand was predominantly used during standard mouse-based computing, and adjusted to a level which allowed for comfortable control of the mouse. For the visual administration of the IVA, the computer sound was eliminated through the disconnection of the external speakers. For the auditory administration of the IVA, the visual stimuli were eliminated by turning off the monitor. For both administrations, recordings were only taken during the

actual CPT portion of the IVA test, and not during the warm-up, practice, or cool-down sections.

Chapter IV

RESULTS

STATISTICAL ANALYSIS

The data from the EEG was analyzed off-line with a Pentium 133 processor using Rhythm software to provide absolute power data. Rhythm analysis employs Hanning windowing and cosine tapering of each selected four-second epoch. The Rhythm software allows for the selection of any length of EEG recording, as long as it has a minimum length of 4 seconds. Additionally, the Rhythm software permits artifact rejection within an individual four-second epoch, as long as the total selected artifact-free section is at least four seconds in duration. This provides a method for the removal of short duration and very small artifact events from the EEG record, thus leaving only artifact-free EEG for analysis. Eye-blinks, large eye movements, and all observable muscle artifacts were removed from the total QEEG record prior to analysis by a visual review of the records by the author.

Nine QEEG channels were recorded and statistically analyzed in this study. These included: frontal-left (F3), central-left(C3), posterior-left (P3), frontal-midline (FZ), central-midline (CZ), posterior-midline (PZ), frontal-right (F4), central-right (C4), and posterior-right (P4). These

sites were selected based upon their relative freedom from artifact interference.

Each location was evaluated within three bandpassess: theta, alpha, and beta. Theta was defined as 4-8 Hz. activity, alpha was defined as 8-13 Hz. activity, and beta was defined as 13-21 Hz. activity. Prior to statistical analysis, the data within these bands were transformed ($\log_{10}$) to obtain Gaussian distributions (Gasser, Bacher, & Mocks, 1982).

Descriptive statistics were calculated in order to show the demographic make-up of the two groups used in the study (ADHD: with and without). Independent t-tests of screening measures were completed to test for group differences.

Tests of the primary hypotheses were conducted using one-tailed independent samples t-tests. The alpha level was set at .05, and following a Bonferroni correction to account for the tests for each band, the level required for significance was .0167.

Tests of the exploratory analysis hypothesis were initially conducted using a 2 x 4 x 4 x 3 x 9 repeated measures ANOVA, with group (ADHD: with/without) as the single between-subjects factor. Condition (visual CPT, auditory CPT, eyes-open baseline, eyes-closed baseline), time (1, 2, 3, 4), band (theta, alpha, beta), and location

(F3, C3, P3, FZ, CZ, PZ, F4, C4, P4) were all within-subject factors.

Significant effects found in the repeated measures analysis were further examined using independent sample t-tests. The application of the most conservative correction to the p value for post hoc tests would require an adjustment to the alpha level equivalent of .05/432. With the understanding of the impossibility of this situation, and the realization that experiment-wide error rate was controlled through the repeated measures design, an alpha level equivalent to .05/2 was utilized for post hoc tests.

RESULTS - SCREENING MEASURES

On measures designed to screen for the presence or absence of ADHD, and to assure group differences, subjects with ADHD were found to be significantly different than controls on the Wender Utah Rating Scale (ADHD: M = 49.7, SD = 7.96; Control: M = 26.2, SD = 4.32) ($t(29.312)^{*} = 11.601$, $p < .001$), the diagnostic criteria from the DSM-IV (ADHD: M = 6.75, SD = 1.65; Control: M = 2.25, SD = 1.35) ($t(38) = 9.171$, $p < .001$), and the Brown Attention Deficit Disorder Scale for Adults (ADHD: M = 49.5, SD = 5.92; Control: M = 34.55, SD = 6.07) ($t(38) = 7.885$, $p < .001$). All

* Equal variances not assumed.

significant t-tests for the screening measures can be found in Table A-1**.

RESULTS - PRIMARY HYPOTHESES

Independent-samples t-tests were conducted to evaluate the hypothesis that individuals with ADHD would produce higher theta and alpha activity, and lower beta activity at location FZ. Results are presented based upon condition.

Significant t-tests: CPT - Visual Stimuli. The test was significant for the theta bandpass $t(38) = 2.840$, $p = .0035$, with the results indicating that individuals in the ADHD group ($M = 5.1547$, $SD = .3104$), had higher theta activity than control subjects ($M = 4.8936$, $SD = .2696$). The eta square index indicated that 17.5% of the variance within the theta bandpass was accounted for by whether the individual was in the ADHD or control group. This value represents a large effect size.

Significant t-tests: Eyes-Open Baseline. The test was significant for the beta bandpass $t(36.008) = -2.998$, $p = .0025$, with the results indicating that individuals in the ADHD group ($M = 4.3528$, $SD = .2345$), had lower beta activity than control subjects ($M = 4.6070$, $SD = .2981$). The eta

** All result section tables can be found in the appendices.

square index indicated that 19% of the variance within the beta bandpass was accounted for by whether the individual was in the ADHD or control group. This value represents a large effect size.

Significant t-tests: Eyes-Closed Baseline. The test was significant for the beta bandpass $t(33.139) = -2.788$, $p = .0045$, with the results indicating that individuals in the ADHD group ($M = 4.2015$, $SD = .3616$), had lower beta activity than control subjects ($M = 4.4725$, $SD = .2415$). The eta square index indicated that 17% of the variance within the beta bandpass was accounted for by whether the individual was in the ADHD or control group. This value represents a large effect size.

The findings presented above were all consistent with the primary hypotheses that adults with ADHD would demonstrate higher theta activity and lower beta activity during the study conditions. No further significant t-tests were found during this analysis.

RESULTS - EXPLORATORY ANALYSIS

Prior to inspection of the results of the repeated measures ANOVA, tests of assumptions were conducted on the variance-covariance matrix of the dependent variables. Specifically, the validity of the use of the F statistic was

determined by assuring that the variance-covariance matrix was circular in form. Mauchly's test of sphericity was used to test this assumption. This revealed that the sphericity assumption was violated, and required an adjustment to the numerator and denominator degrees of freedom. This adjustment was applied using the Greenhouse-Geisser epsilon, which provides a conservative estimate of F-values, especially for small sample sizes (SPSS, 1997).

Following the application of the Greenhouse-Geisser adjustment, a significant 5-way interaction of condition x time x band x location x group was found ($F(38, 11.516,) = 2.337$, $p = .007$). This finding confirmed the general hypotheses that there would be significant differences in cortical activity between adults with and adults without ADHD during CPT performance (hypotheses 1), and during baseline recordings (hypotheses 2). Post hoc analyses of this significant interaction are reported in the remainder of this section. These reports are divided by task in accordance with the hypotheses of the study. ANOVA tables for all within-subject effects are included in the appendices (A-91).

Significant t-tests: CPT - Visual Stimuli. During the second omission section of the visual CPT, results confirmed the hypothesis that adults with ADHD would demonstrate

higher theta activity than controls. As presented in Figure 1, this finding occurred at locations F3 (ADHD: M = 5.116, SD = .3030; control: M = 4.8487, SD = .2434) (t(38) = 3.076, p = .004), C3 (ADHD: M = 5.0581, SD = .3349; control: M = 4.8160, SD = .2367) (t(38) = 2.639, p = .012), and FZ (ADHD: M = 5.1547, SD = .3104; control: M = 4.8936, SD = .2696) (t(38) = 2.84, p = .007). All significant t-tests for the visual CPT are displayed in Table A-2. No further significant t-tests were found for this condition.

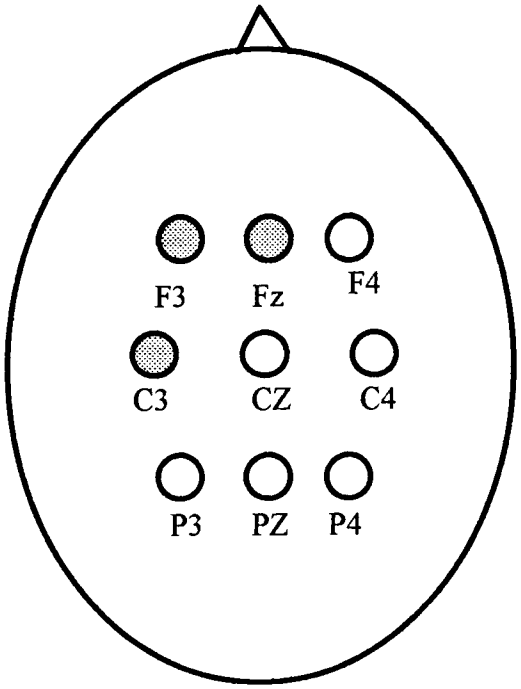


Figure 1. Increases in theta activity for the ADHD group during the second omission section of the visual CPT.

Significant t-tests: CPT - Auditory Stimuli. During the first commission section of the auditory CPT, subjects with ADHD had less theta activity than controls at location CZ (ADHD: *M* = 4.6583, *SD* = .2008; control: *M* = 4.8453, *SD* = .2255) (*t*(38) = -2.77, *p* = .009). This finding was counter to the hypothesis that adults with ADHD would show higher theta activity.

During the first omission section, subjects with ADHD had less beta activity at location FZ (ADHD: *M* = 4.3746, *SD* = .2468; control: *M* = 4.5472, *SD* = .2031) (*t*(38) = -2.415, *p* = .021). This finding, as displayed in Figure 2, confirmed the hypothesis that adults with ADHD would have less beta activity.

During the second omission section, subjects with ADHD had less alpha activity at location PZ (ADHD: *M* = 4.7215, *SD* = .4747; control: *M* = 5.0581, *SD* = .3867) (*t*(38) = -2.459, *p* = .019). This finding was counter to the expected hypothesis that adults with ADHD would have greater alpha activity. All significant t-tests for the CPT with auditory stimuli are displayed in Table A-3. No further significant t-tests were found for this condition.

Significant t-tests: Eyes-Open Baseline. During the eyes-open baseline, subjects with ADHD had less theta activity than those without ADHD, for the time period corresponding

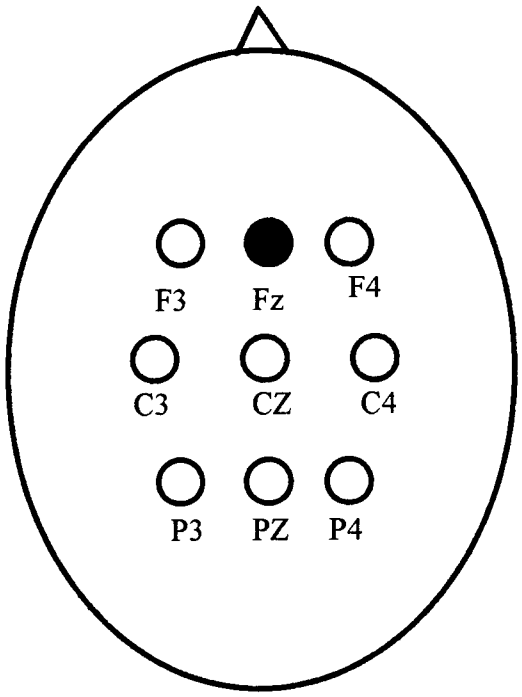


Figure 2. Decreases in beta activity for the ADHD group during the first omission section of the auditory CPT.

to the first commission section of the CPTs, at location CZ (ADHD: M = 4.6191, SD = .2789; control: M = 4.8378, SD = .2295) ($t(38) = -2.708$, $p = .01$). This finding was counter to the hypothesis that adults with ADHD would have greater theta activity during the eyes-open baseline.

For the time period corresponding to the first omission section, subjects with ADHD had less theta activity at location CZ (ADHD: M = 4.6435, SD = .3644; control: M = 4.9136, SD = .2677) ($t(38) = -2.671$, $p = .011$). This result

was counter to the hypothesis that adults with ADHD would have greater theta activity during the eyes-open baseline.

For the time period corresponding to the second commission section during both CPTs, subjects with ADHD had less theta activity at location CZ (ADHD: M = 4.628, SD = .274; control: M = 4.8378, SD = .2558) (t(38) = -2.504, p = .017). This finding was counter to the hypothesis that adults with ADHD would produce greater theta activity during the eyes-open baseline. As presented in Figure 3, the hypothesis that adults with ADHD would produce less beta activity was confirmed for this section at locations F3

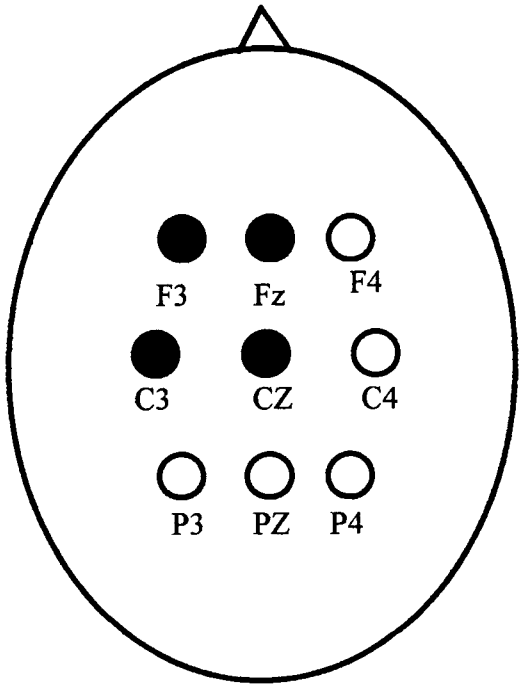


Figure 3. Decreases in beta activity for the ADHD group during eyes-open baseline. Time period corresponds to the second commission section of the CPT.

(ADHD: M = 4.2459, SD = .2285; control: M = 4.4106, SD = .1648) (t(38) = -2.614, p = .013), C3 (ADHD: M = 4.3426, SD = .2025; control: M = 4.4904, SD = .1945) (t(38) = -2.354, p = .024), FZ (ADHD: M = 4.1915, SD = .3118; control: M = 4.4051, SD = .1836) (t(38) = -2.64, p = .21), and CZ (ADHD: M = 4.1452, SD = .2725; control: M = 4.4029, SD = .2077) (t(38) = -3.364, p = .002).

For the time period corresponding to the second omission section, subjects with ADHD again demonstrated less beta activity at locations FZ (ADHD: M = 4.2015, SD = .3616; control: M = 4.4725, SD = .2415) (t(38) = -2.788, p = .008), and CZ (ADHD: M = 4.1984, SD = .2962; control: M = 4.4247, SD = .2822) (t(38) = -2.473, p = .018). These results, presented in Figure 4, again confirmed the hypothesis of less beta activity for the ADHD group. All significant t-tests for the eyes-open baseline are displayed in Table A-4. No further significant t-tests were found for this condition.

Significant t-tests: Eyes-Closed Baseline. During the eyes-closed baseline, subjects with ADHD had less alpha activity than those without ADHD, for the time period corresponding to the first commission section of the CPTs, at location PZ (ADHD: M = 4.8907, SD = .4091; control: M =

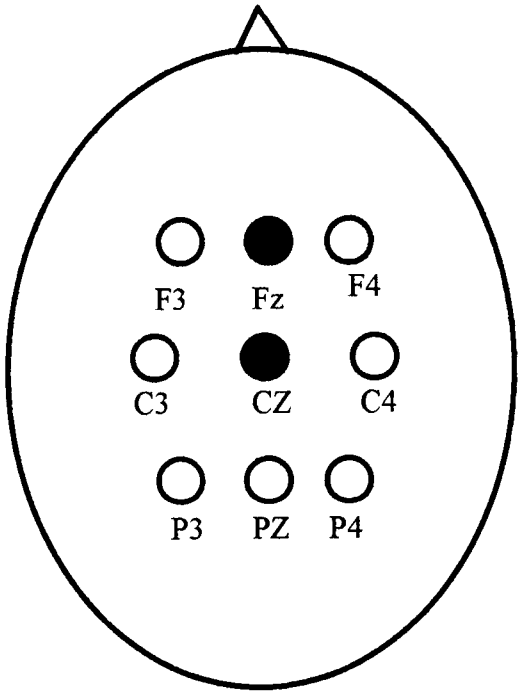


Figure 4. Decreases in beta activity for the ADHD group during eyes-open baseline. Time period corresponds to the second omission section of the CPT.

5.2397, SD = .5069) (t(38) = -2.396, p = .022). This finding was counter to the hypothesis that adults with ADHD would produce greater alpha than those individuals without ADHD during the eyes-closed baseline.

Findings which confirmed the hypothesis that adults with ADHD would produce less beta activity were found for the time period corresponding to the first omission section of the CPT. These findings, presented in Figure 5, occurred at locations F3 (ADHD: M = 4.3661, SD = .1823; control: M = 4.5774, SD = .2768) (t(38) = -2.852, p = .007),

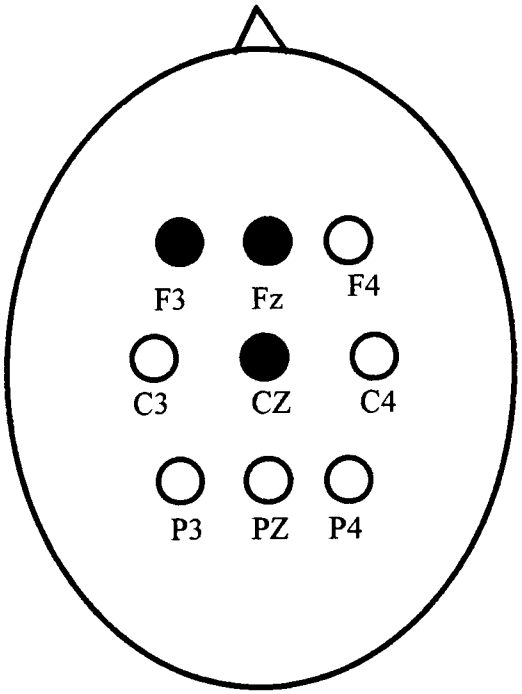


Figure 5. Decreases in beta activity for the ADHD group during eyes-closed baseline. Time period corresponds to the first omission section of the CPT.

FZ (ADHD: M = 4.3483, SD = .2301; control: M = 4.5791, SD = .29) (t(38) = -2.787, p = .008), and CZ (ADHD: M = 4.3586, SD = .2665; control: M = 4.5927, SD = .3422) (t(38) = -2.414, p = .021).

For the time period corresponding to the second omission section of the CPT, adults with ADHD had less beta activity at locations F3 (ADHD: M = 4.3896, SD = .2230; control: M = 4.5987, SD = .2893) (t(38) = -2.561, p = .015), FZ (ADHD: M = 4.3528, SD = .2345; control: M = 4.607, SD = .2981) (t(38) = -2.998, p = .005), CZ (ADHD: M = 4.3053, SD

= .255; control: M = 4.5898, SD = .3613) (t(38) = -2.877, p = .007), and PZ (ADHD: M = 4.3535, SD = .2390; control: M = 4.6136, SD = .3476) (t(38) = -2.758, p = .009). These findings, presented in Figure 6, confirm the hypotheses that adults with ADHD would produce greater theta and less beta during the eyes-closed baseline. All significant t-tests for the eyes-closed baseline are displayed in Table A-5. No further significant t-tests were found during this condition.

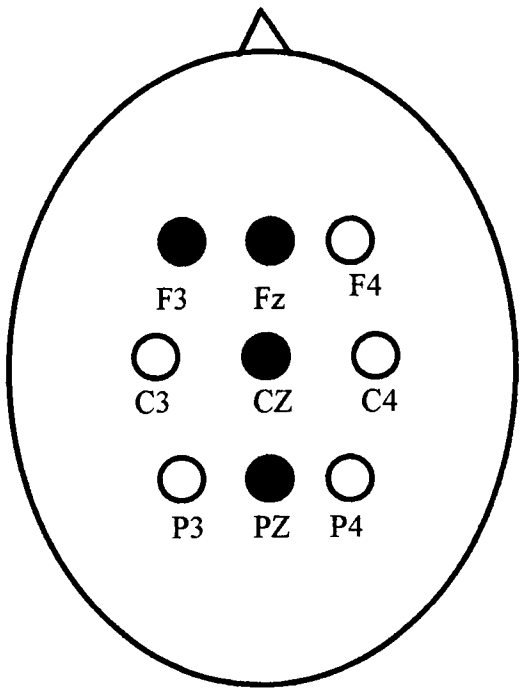


Figure 6. Decreases in beta activity for the ADHD group during eyes-closed baseline. Time period corresponds to the second omission section of the CPT.

Correlations: CPT Performance Change Scores and Eyes-open Baseline Power Ratios. Four separate power ratios were calculated from the EEG during the first 1:18 min. of the eyes-open baseline. These included the ratio of theta to beta activity at locations FZ and CZ, and the ratio of alpha to beta activity at FZ and CZ. Each ratio was then compared to the changes in response time, measured in milliseconds, between the first and third quartiles of the visual CPT.

Results indicated that for adults with ADHD, significant correlation coefficients were found between CPT change scores and the theta/beta ratios at locations CZ ($r(18) = .463$, $p = .027$) and FZ ($r(18) = .531$, $p = .016$). No significant correlations were found between change scores and alpha/beta ratios for subjects with ADHD. Additionally, no significant correlations were found for either ratio within the control group. These findings partially confirmed the hypothesis that poorer performance on the CPT would be correlated with higher theta/beta and alpha/beta ratios. It was hypothesized, however, that this correlation would occur within both groups. The correlational matrices for the ADHD and control groups are presented in Tables A-6 and A-7, respectfully.

Chapter V

DISCUSSION

The purpose of the present study was to determine if significant cortical differences existed between adults with ADHD and controls, when assessed using visual and auditory continuous performance tasks, and eyes-open and eyes-closed baseline recordings. The primary hypothesis that there would be specific differences was generated based on numerous findings within the literature. Specifically, previous studies have demonstrated that performance on CPTs and other vigilance tasks leads to distinct cortical changes as indicated by the EEG. Studies have indicated increases within the theta and alpha bands, and decreases within the beta band, over the time course of the test. Perhaps more intriguing, are results which suggest that cortical changes are linked to changes in performance. Individuals with increases in theta during a testing session have a lessened probability of correctly identifying a target and decreases in beta have shown predictive ability of final score.

Based upon the suggestions put forth by Valentino, et al. (1993) the present study sought to evaluate the cortical activity of a clinical population, during the presentation of a CPT. The population used in this study, adults with ADHD, were a natural choice based again upon previous findings. Studies have demonstrated that individuals with

ADHD possess increased levels of slow wave activity in their EEGs (Lubar, 1995). Further, these findings have been particularly evident during tasks involving cognitive challenge (Crawford & Barbasz, 1996; Mann, et al., 1991). On a more practical side, due to inherent difficulties in diagnosing this population, the adult ADHD is a clinical sample in need of a measure combining consistent physiological changes with established, and well controlled, laboratory measures.

The overall results of the present study suggest a difference in cortical activity between adults with ADHD and adults without ADHD on continuous performance tests and baseline recordings. Testing the presence of these differences at location FZ, the results indicated increases in theta activity during the CPT using visual stimuli, and decreases in beta activity during the eyes-open and eyes-closed baselines.

While consistent with aspects of the general study hypothesis, the interpretation of the findings from the exploratory analysis are problematic. The overall result of a significant 5-way interaction between condition, time, band, location, and group is the result of a repeated measures design which collapses the values across all factors. This implies that somewhere within the 4 x 4 x 3 x 9 x 2 interaction differences responsible for the

significant finding exist. The goal of the post hoc tests was to determine where these significant findings may be located.

Throughout the visual CPT, ADHD subjects had significantly higher theta activity during the second section, when omission errors were more likely. During this section of the test, targets are rare and the subject must remain vigilant to the test demands. Increases in theta activity, which has been described as being associated with inattention and daydreaming activity (Lubar, 1995), would indicate that cortically, ADHD subjects were engaged in activity known to be associated with inattention.

Omission sections during the CPT have been described as sections when the mind has a tendency to wander due to the relaxed demands of the tests (Sanford & Turner, 1994). One needs to remain vigilant during these sections despite the reduction in external stimuli. Thus, internal mechanisms must be utilized to remain true to the demands of the task. For the ADHD subject, remaining vigilant following approximately 12 minutes of task demands, results in significantly higher theta activity. While confirming the dissertation hypothesis, this finding also confirms studies which have indicated the development of increased theta during vigilance tests and CPTs (Beatty & O'Hanlon, 1980; Daniel, 1967).

During the auditory CPT, the pattern of cortical differences between ADHD and control subjects did not resemble that observed during the visual CPT. Initially these results were surprising since the two CPTs are identical in terms of rate, number, and frequency of stimuli presented. During the first two sections of this test, ADHD subjects had cortical activity which was opposite of the predicted outcome. They had decreased theta activity during the first commission section and decreased alpha activity during the first omission section.

These findings may represent a novelty effect when completing the task demands. ADHD subjects have been shown to be highly influenced by the novelty of certain situations (Sears & Thompson, 1998). If this was indeed the case, ADHD subjects would have shown theta and alpha patterns similar to control subjects, and would have demonstrated decreases, as was shown by these findings. One potential difficulty with this conclusion is in explaining why the same effect did not occur during the visual CPT, a nearly identical situation which should have been just as novel. Changes of this type, however were not found during the visual CPT.

A finding which did confirm previous hypotheses was the decreases in beta during the first omission section. While only one finding was consistent with the hypothesis, there was a trend toward decreases in beta that did not reach

significance. During the first omission section, in addition to the finding mentioned, there were additional non-significant decreases in beta at locations CZ (p = .027) and F4 (p = .026).

One possible reason that there were mixed differences during the auditory CPT could be the design of the task requirements. As mentioned above, the visual and auditory CPTs are nearly identical in terms of rate, number, and frequency of stimuli. The only difference is in the type of stimuli used. During both CPTs subjects were instructed to sit quietly and respond when they either heard or saw the appropriate stimuli for the particular test. Unlike the visual CPT where subjects were required to remain focused on one object, the screen, where the stimuli were presented, the auditory CPT possessed no such ''built-in'' mechanism to artificially hold the subject's attention. Due to this constraint, both groups of subjects may have had a greater tendency to produce increased levels of alpha and theta, and decreased levels of beta. Due to these consistent changes, the magnitude of difference between the groups may have been less aparent, thus resulting in non-significant findings.

During the eyes-open baseline, a similar pattern of activity occurred during the first portion of the recording, as did in the auditory CPT. During this portion, there was decreased theta activity at location CZ. This was the same

band and location where theta activity was lower during the auditory CPT. During the eyes-open baseline, decreased theta activity at CZ continued throughout the first portions of the test and continued into that portion of the baseline which approximates the second commission section. Within the beta band, however, the hypothesis of decreased beta, was evident throughout the final 2:36 minutes of the recording. These changes were also consistent across two of the channels (FZ and CZ).

The decreases observed in beta during the later portion of the eyes-open baseline were consistent with the cortical differences found during the eyes-closed baseline. During the later portion of this recording, there were significant decreases in beta at locations F3, FZ, CZ, and PZ. During the eyes-closed baseline however, these decreases also occurred during the earlier portions of the recording (1:18 - 2:36 minutes) at locations F3, Fz, and CZ. This finding is suggestive of a consistent pattern of decreased beta which begins early, and remains throughout the recording. The question of whether decreased beta occurs throughout the recording was not evaluated in this investigation.

The beginning of the eyes-closed baseline again indicated a finding counter to that expected by the exploratory hypothesis. There was a significant decrease in alpha activity for the ADHD group during the first 1:18 of

the baseline. Looking across all four conditions, there appears to be a consistent trend which occurs in the first section of each condition, with the exception of the visual CPT. The trend, representing a tendency which is counter to the study hypothesis, is that the ADHD group demonstrates significant decreases in slower wave activity (alpha and theta) compared to control subjects. During the auditory CPT and the eyes-open baseline there were significant decreases in theta at location CZ. During the eyes-closed baseline, this group also demonstrated decreases in alpha at PZ. Do these decreases represent an effect of novelty during the first portion of these conditions? As indicated earlier, studies of individuals with ADHD have indicated that novelty plays an important role in the individual's ability to focus (Sears and Thompson, 1998). Perhaps ADHD subjects are initially involved in the task, and cortical processing, which would indicate more efficient processing, exceeds that of control subjects. Interestingly, and perhaps predictably, these effects do not appear to be long lasting, with the findings of decreased beta in the sections occurring 1:18-2:36 minutes into the recordings. Even if subjects are not involved in the task, the decreases in alpha and theta indicate interest or involvement in some mental event (Duffy, Iyer, & Surwillo, 1989).

Another aspect of this finding is that for the ADHD group, the differences do not appear to include the beta bandpass, which is most indicative of higher, concentrative processing (Duffy, Iyer, & Surwillo, 1989). Do individuals with ADHD have some control over activity in those bands indicative of lower processing, thus keeping themselves from "tuning-out" for brief periods of time?

As suggested earlier, the question as to why the pattern of activity seen during the auditory CPT and the two baselines, was not evident during the visual CPT, may be due to differences in task requirements. Possessing clear focus points which "hold" the subject's position to where stimuli are presented, may have lead to a more consistent cortical presentation. This being the case, the cortical changes which occurred during the visual CPT may represent a truer picture of the deficits between adults with ADHD and those without. Despite being instructed to gaze in the direction of the monitor during the auditory CPT and to maintain a consistent position during the baseline recordings, subjects may not have completely adhered to these rules. The design of the present study did not allow for continuous monitoring of the subject's gaze, and this aspect may be an important consideration for future studies. The changes which occurred during the auditory CPT may be the result of cognitive processing about the experimental

room or other irrelevant thoughts. The confirmation of this finding may also be consistent with suggestions by Barkley (1997) that poor CPT performance may represent difficulties with adherence to verbal instructions. Specifically instructions to perform simple, boring, unreinforcing tasks over a prolonged period. Other researchers have noted that ADHD subjects report more task-irrelevant thoughts during the CPT than normals (Shaw & Giambra, 1993). Interestingly, while task-irrelevant thoughts may lead to poorer CPT performance, the present data suggest that these thoughts may initially lead to decreases in slow-wave activity.

Evaluating the differences between sections of the CPTs, specifically the differences between sections where commission errors were more likely and sections where omission errors were more likely, subjects with ADHD appeared to have greater difficulty during omission sections. Of the significant changes between groups, which confirmed the stated hypothesis, all four changes occurred during omission sections of the test. Three of these changes occurred during the final omission section of the visual CPT, with the other result occurring during the first omission section of the auditory CPT. These findings confirm investigations conducted by Rasey, Craig, and Lubar (1998) and Rasey, Lubar, and Craig (1997) which demonstrated increased alpha and theta activity combined with decreased

beta activity during omission sections of a CPT. While these investigations were conducted using normal subjects, the pattern of cortical activity is consistent. It should be noted that one finding contrary to the stated hypothesis occurred in the second omission section of the auditory CPT. Within this section, ADHD subjects had decreased levels of alpha activity.

Turning to an evaluation of the locations which demonstrated significant differences between the two groups, it is important to first review cortical areas which have been shown to represent difficulty within the ADHD population. As discussed earlier, Lubar (1995) indicated that the excessive slow-wave activity found in individuals with ADHD has primarily been found in central and frontal regions of the brain. Additional studies have supported these findings, and have explained the increases in slow-wave activity as indicating decreased metabolism in these regions (Amen & Carmichael, 1997; Amen, Paldi, & Thisted, 1993). Results indicating difficulties within the frontal lobes have also been consistent among evaluations of EEG during cognitive performance (Crawford & Barabasz, 1996; Mann, et al., 1991).

Results of the exploratory analysis support the contention that individuals with ADHD have their greatest impairments within areas measuring activity of the frontal

lobes. During the visual CPT there were increases in theta at F3 and FZ, decreases in beta at location FZ during the auditory CPT, and during the baselines, eyes-open included decreases in beta at locations F3 and FZ, with these same two locations demonstrating decreases in beta during the eyes-closed baseline. In all, evaluating the changes which confirmed the stated hypotheses, 10 of the 17 significant differences were within locations anatomically located on the frontal lobes. These results indicate that nearly 60% of the sites showing significant differences, indicated deficits within the frontal lobes.

Results evaluating theta/beta and alpha/beta power ratios during the eyes-open baseline and changes in performance on the visual CPT, suggest significant differences between baseline measures of cortical activity and CPT performance. Performance scores were determined by evaluating the average response score during the first portion of the test with that during the last portion of the test. While there were no significant correlations when groups were evaluated together, significant correlations did appear within the ADHD group when the two groups were evaluated separately. Significance was found between the theta/beta ratios at CZ and FZ and visual CPT performance. These results suggest that increased baseline ratios may be predictive of poorer performance on CPTs.

The evaluation of EEG power ratios has been shown to be predictive of difficulties within the child and adult ADHD populations (Lubar, 1995; Mann, et al., 1991). Higher ratios have typically been indicative of increased symptom severity, and are consistently used within the field of Neurofeedback (EEG Biofeedback) as a diagnostic and evaluative measure (Lubar, Swartwood, Swartwood, and Timmerman, 1995).

CHAPTER VI

SUMMARY AND CONCLUSIONS

The results of the present study demonstrate that adult subjects with ADHD show patterns of EEG activity, associated with less efficient processing, when compared to controls during the administration of visual and auditory CPTs and eyes-open and eyes-closed baseline recordings. The present study further demonstrates that adults with ADHD can be reliably evaluated on EEG measures during the administration of visual and auditory continuous performance tasks. In the search for more inclusive measures that would reliably distinguish adults with and without ADHD, measures combining the positive aspects of current laboratory evaluations may prove to be the most useful.

Perhaps the most significant finding of the study occurred during the visual CPT. Within this condition, ADHD subjects showed significant increases in the theta bandpass compared with controls. What made this finding unique compared to differences in other conditions was its consistency. Every increase took place during the final section of the test, the second omission section, and deficits included anatomical locations over the frontal lobes. These three findings represent consistencies with previous studies that have evaluated vigilance and CPT performance, the production of EEG in individuals with ADHD,

and recognized deficit based upon anatomical characteristics.

The cortical patterns associated with processing during the visual CPT were also free from differences which did not confirm both the research hypotheses and previous studies. As discussed earlier, visual CPTs may represent a more effective method than auditory CPTs for studies requiring consistency in performance measures. The conclusions, that subjects during the auditory CPT may have been processing different aspects of the experimental room or other task-irrelevant material, are partially justified by the inconsistent findings during this condition.

Two findings that emerged during the baseline recordings were the discovery that decreases in beta activity was by far the most consistent finding, and differences primarily occurred during the later minutes of both baselines. Differences occurring during later portions of the recordings were also consistent with the findings from the visual CPT. These data suggest that EEG activity combined with CPT performance, or EEG combined with baseline recordings, must be of sufficient length before consistently significant differences emerge. As indicated by the early differences which did not confirm stated hypotheses or previous findings, recordings during later portions of these conditions indicated different results.

When interprting the results of the present study, it is important to recognize that many of the expected changes in EEG activity between ADHD and control subjects did not occur. Specifically, for the test of primary hypotheses, only three of the twelve expected changes occured. For the exploratory analysis the percentage of changes consistent with the stated hypothesis falls to 17 out of a possible 108. The true evaluation of the findings presented in this study ultimately depend upon future investigations designed to examine the specific outcomes discussed above.

Additionally, there are a number of other aspects aspects of this study which deserve further investigation. These are discussed without preference to any implied importance.

Inherent with many studies that include the evaluation of EEG activity is the issue of statistical significance. While the present study was designed to limit the total number of potential variables requiring examination, studies utilizing increased sample sizes are clearly needed to evaluate those areas not included in this study. These include cortical locations anatomically located over the temporal and occipital regions, and the frontal poles. In addition, bandpasses which include 1-4 Hz. and 21-32 Hz. activity should be evaluated.

As discussed above, another area requiring additional investigation is within the areas of cortical changes over time. This would require examining the pattern of cortical differences in early portions of the testing condition, and comparing them across all minutes. For the findings of the present study, investigations of this type could potentially answer questions such as: When did the increases in theta first become apparent? Did they fluctuate across the time course of the test, or did they remain stable over time? When do the early findings that were contrary to the stated hypotheses cease being significant? These and numerous other quesitons, all represent itmes of importance that need to be answered if the recording of EEG during CPT performance is to become a consistently accepted measure.

Specific questions regarding the most appropriated types of CPTs for evaluative utility require further research. As the present study demonstrated, the pattern of cortical differences was extremely different between the auditory and visual CPTs.

Finally, and in a manner similar to conclusions made by Valentino, Arruda, and Gold (1993), studies evaluating both normal and clinical populations need to be continued. The utility of using EEG as an assessment tool, in combination with cognitive and other measures, can only be accomplished through continued exploration.

REFERENCES

REFERENCES

Achenbach, T.M., Howell, C.T., McConaughy, S.H., & Stanger, C. (1995). Six-year predictors of problems in a national sample: III. transitions to young adult syndromes. Journal of the American Academy of Child and Adolescent Psychiatry, 34, 658-669.

Amado, H., & Lustman, P.J. (1982). Attention deficit disorders persisting in adulthood: a review. Comprehensive Psychiatry, 23, 300-314.

Amen, D.G., & Carmichael, B.D. (1997). High-resolution brain SPECT imaging in ADHD. Annals of Clinical Psychiatry, 9, 81-86.

Amen, D.G., Paldi, J.H., & Thisted, R.A. (1993). Brain SPECT imaging. Journal of the American Academy of Child and Adoloscent Psychiatry, 32, 1080-1081.

American Psychiatric Association. (1994). Diagnostic and statictical manual of mental disorders (4th ed.). Washington, DC: Author.

Barkley, R.A. (1990). Attention-deficit hyperactivity disorder: a handbook for diagnosis and treatment. New York: Guilford Press.

Barkley, R.A. (1991). The ecological validity of laboratory and analogue assessments of ADHD symptoms. Journal of Abnormal Child Psychology, 19, 149-178.

Barkley, R.A. (1997a). Behavioral inhibition, sustained attention, and executive functions: constructing a unifying theory of adhd. Psychological Bulletin, 121, 65-94.

Barkley, R.A. (1997b). ADHD and the nature of self-control. New York: The Guilford Press.

Barkley, R.A., DuPaul, G.J., & McMurray, M.B. (1990). A comprehensive evaluation of attention deficit disorder with and without hyperactivity. Journal of Consulting and Clinical Psychology, 58, 775-789.

Barkley, R.A., Grodzinsky, G., & DuPaul, G. (1992). Frontal lobe functions in attention deficit disorder with and without hyperactivity: a review and research report. Journal of Abnormal Child Psychology, 20, 163-188.

Barkley, R.A., Guevremont, D.C., Anastopoulos, A.D., DuPaul, G.J., & Shelton, T. (1993). Driving-risks and outcomes of attention deficit hyperactivity disorder in adolescents and young adults: a 3-5 year follow-up survey. Pediatrics, 92, 212-218.

Beatty, J., Greenberg, A., Deibler, W.P., & O'Hanlon, J.F. (1974). Operant control of occipital theta rhythm affects performance in a rader monitoring task. Science, 183, 871-873.

Beatty, J., & O'Hanlon, J. (1980). Operant control of posterior theta rhythm and vigilance performance: Repeated treatments and transfer of training. In N. Birbaumer & H. Kimmel (Eds), Biofeedback and Self-Regulation (pp. 247-258). Hillsdale, NJ: Lawrence Erlbaum Associates.

Beck, A.T., Ward, C.H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measureing depression. Archives of General Psychiatry, 4, 561-571.

Cantwell, D.P. (1972). Psychiatric illness in the families of hyperactive children. Archives of General Psychiatry, 27, 414-417.

Castellanos, F.X., Giedd, J.N., Eckburg, P., Marsh, W.L., Vaituzis, C., Kaysen, D., Hamburger, S.D., & Rapoport, J.L. (1994). Quantitative morphology of the caudate nucleus in attention dificit hyperactivity disorder. American Journal of Psychiatry, 151, 1791-1796.

Castellanos, F.X., Giedd, J.N., Marsh, W.L., Hamburger, S.D., Vaituzis, A.C., Dickstein, D.P., Sarfatti, S.E., Vauss, Y.C., Snell, J.W., Lange, N., Kaysen, D., Krain, A.L., Ritchhie, G.F., Rajapakse, J.C., & Rapoport, J.L. (1996). Quantitative brain magnetic resonance imaging in attention-defict hyperactivity disorder. Archives of General Psychiatry, 53, 607-616.

Corkum, P.V., & Siegel, L.S. (1993). Is the continuous performance task a valuable research tool for use with shildren with attention-deficit-hyperactivity disorder? Journal of Child Psychology and Psychiatry, 34, 1217-1239.

Crawford, H.J., & Barabasz, M. (1996). Quantitative EEG magnitudes in children with and without attention deficit disorder during neurological screening and cognitive tasks. Child Study Journal, 26, 71-86.

Daniel, R.S. (1967). Alpha and theta EEG in vigilance. Perceptual and Motor Skills, 25, 697-703.

Douglas, V.I. (1983). Attention and cognitive problems. In M. Rutter (Ed.), Developmental neuropsychiatry (pp. 280-329). New York: Guilford Press.

Downey, K.K., Stelson, F.W., Pomerleau, O.F., & Giordani, B. (1997). Adult attention deficit hyperactivity disorder: psychological test profiles in a clinical population. Journal of Nervous and Mental Disease, 185(1), 32-38.

Duffy, F.H., Iyer, V.G., & Surwillo, W.W. (1989). Clinical and electroencephalography and topographic brain mapping. New York: Spinger-Verlag.

Fallgatter, A.J., Brandeis, D., & Strik, W.K. (1997). A robust assessment of the nogo-anteriorisation of P300 microstates in a cued continuous performance test. Brain Topography, 9(4), 295-302.

Fallgatter, A.J. & Strik, W.K. (1997). Right frontal activation during the continuous performance test assessed with near-infrared spectroscopy in health subjects. Neuroscience Letters, 223, 89-92.

Gale, A. (1977). Some EEG correlates of sustained attention. In R.R. Mackie (Ed.), Vigilance (pp. 263-283). New York: Plenum.

Gittelman, R. (1985a). Parent questionnaire of teenage behavior (modified Conners). Psychopharmacology Bulletin, 21, 923-924.

Goldstein, S. (1997). Managing attention and learning disorders in late adolescence and adulthood: a guide for practitioners. New York: Wiley.

Goldstein, S., & Goldstein, M. (1990). Managing attention disorders in children: a guide for practitioners. New York: Wiley.

Gordon, M. (1983). The gordon diagnostic system. DeWitt, NY: Gordon Systems.

Gordon, M., & Mettelman, B.B. (1988). The assessment of attention: I. standardization and reliability of a behavior based measure. Journal of Clinical Psychology, 44, 682-690.

Greene, R.W., & Barkley, R.A. (1995). Clinic-based assessment of attention-deficit/hyperactivity disorder. Journal of Psychoeducational Assessment, Special ADHD Issue, 61-73.

Grodzinsky, G.M., & Diamond, R. (1992). Frontal lobe functioning in boys with attention-deficit hyperactivity disorder. Developmental Neuropsychology, 8, 427-445.

Gualitieri, C.T., Ondrusek, M.G., & Finley, C. (1985). Attention deficit disorders in adults. Clinical Neuopharmacology, 8, 343-356.

Hartocollis, P. (1968). The syndrome of minimal brain dysfunction in young sdults. Bulletin of the Menninger Clinic, 32, 102-114.

Hechtman, L., Weiss, G., Perlman, T., Hopkins, J., & Wener, A. (1979). Hyperactive children in young adulthood: a controlled perspective ten-year follow-up. International Journal of Mental Health, 8, 52-66.

Haider, M., Spong, P., & Lindsley, D.B. (1964). Attention, vigilance, and cortical evoked potnetials in humans. Science, 145, 180-182.

Haider, M. (1967). Vigilance, attention, expectation and cortical evoked potentials. Acta Psychologica, 27, 246-252.

Jackson, B., & Farrugia, D. (1997). Diagnosis and treatment of adults with attention deficit hyperactivity disorder. Journal of Counseling and Development, 75, 312-319.

Jasper, H.H. (1958). The ten-twenly electrode system of the International Federation. Electroencephalography and Clinical Neurophysiology, 10, 277-278.

Katz, K.S., Dubowitz, L.M., Henderson, S., Jongmans, M., Kay, G.G., Nolte,C.A., & de-Vries, L. (1996). Effect of cerebral lesions on continuous performance test responses of school age children born prematurely. Journal of Pediatric Psychology, 21, 841-855.

Kaufmann, P.M., Fletcher, J.M., Levin, H.S., Miner, M.E., & Ewing-Cobbs, L. Attentional disturbance after pediatric closed head injury. Journal of Child Neurology, 8, 348-353.

Kellaway, P., Pertersen, I. (1976). Quantitative analytic studies in epilepsy. New York: Raven Press.

Klee, S.H., Garfinkel, B.D., & Beauchesne, H. (1986). Attention deficits in adults. Psychiatric Annals, 16, 52-56.

Losier, B.J., McGrath, P.J., & Klein, R.M. (1996). Error patterns on the continuous performance test in non-medicated and medicated samples of children with and without adhd: a meta-analytic review. Journal of Child Psychiatry, 37, 971-987.

Lubar, J.F. (1995). Neurofeedback for the management of attention-deficit hyperactivity disorder. In M.S. Schwartz (Ed.) Biofeedback: a practitioner's guide (p. 493-522). New York: Guildford.

Lubar, J.F., Swartwood, M.O., Swartwood, J.N., & Timmerman, D.L. (1995). Quantitative EEG and auditory event-related potentials in the evaluation of attention-deficit hyperactivity disorder: effects of methlphenidate and implications for neurofeedback training. Journal of Psychoeducational Assessment, ADHD Special,141-160.

Mann, C., Lubar, J., Zimmerman, A., Miller, C., & Muenchen, R. (1991). Quantitative analysis of EEG in boys with attention-deficit-hyperactivity disorder: controlled study with clinical implications. Pediatric Neurology, 8, 30-36.

Mannuzza, S., Klein, R.G., Bessler, A.A., Malloy, P., & LaPadula, M. (1993). Adult outcome of hyperactive boys: education achievement, occupational rank, and psychiatric status. Archives of General Psychiatry, 50, 565-576.

Mannuzza, S., Klein, R.G., Bessler, A.A., Malloy, P., & Hynes, M.E. (1993). Educational and occupational outcome of hyperactive boys grown up. Journal of the American Academy of Child and Adolescent Psychiatry, 36, 1222-1227.

Mannuzza, S., Klein, R.G., Bessler, A., Malloy, P., & LaPadula. (1998). Adult psychiatric status of hyperactive boys grown up. American Journal of Psychiatry, 155, 493-498.

Menkes, M.H., Rowek, J.S., & Menkes, J.H. (1967). A 25-year follow-up study on the hyperkinetic child with MBD. Pediatrics, 39, 393-399.

Mariani, M., & Barkley, R.A. (1997). Neuropsychological and academic functioning in preschool children with attention deficit hyperactivity disorder. Manuscript submitted for publication.

Mirsky, A.F. (1987). Behavioral and psychophysiological markers of disordered attention. Environmental Health Perspectives, 74, 191-199.

Mirsky, A.F. (1989). The neuropsychology of attention: lelments of a complex behavior. In E. Perecman (Ed.), Integrating theory and practice in clinical neuropsychology (pp. 75-91). Hillside, NJ: Erlbaum.

Morrison, J.R. (1979). Diagnosis of adult psychiatric disorders in patients with childhood hyperactivity. American Journal of Psychiatry, 136, 955-958.

Morrison, J.R. (1980). Adult psychiatric disorders in parents of hyperactive children. American Journal of Psychiatry, 137, 825-827.

Murphy, K., & Barkley, R.A. (1996). Attention deficit hyperactivity disorder adults: comorbidities and adaptive impairments. Comprehensive Psychiatry, 37(6), 393-401.

O'Neal, P., & Robins, L.E. (1958). The relation of childhood behavior problems to adult psychiatric status. a 30-year follow-up study of 150 subjects. American Journal of Psychiatry, 114, 961-969.

Pass, H.L., Klorman, R., Salzman, L.F., Klein, R.H., & Kaskey, G.B. (1980). The late positive component of the evoked response in acute schizophrenics during a test of sustained attention. Biological Psychiatry, 15, 9-20.

Primac, D.W., Mirsky, A.F., & Rosvold, H.E. (1957). Effects of centrally acting drugs on two tests of brain damage. Archives of Neurology and Psychiatry, 77, 328-332.

Rasey, H.W., Craig, F.W., & Lubar, J.F. (April, 1998). Electro-physiological changes in cortical EEG during early versus late-stage processing of a continuous performance task. Poster presented at the 29th annual meeting of the Association for Applied Psychophysiology and Biofeedback. Orlando, FL. USA.

Rasey, H.W., Lubar, J.F., & Craig, F.W. (April, 1997). EEG power and coherence differences between omission and commision sections of a continuous performance task. Poster presented at the 28th annual meeting of the Association for

Applied Psychophysiology and Biofeedback. San Diego, CA. USA.

Ratey, J.J. (1991, Fall/Winter). Paying attention to attention in adults. CH.A.D.D.ER Newsletter, pp. 13-14.

Ratey, J.J., Greenberg, M.S., Bemporad, J.R., & Lindem, K.J. (1992). Unrecognized attention-deficit hyperactivity disorder in adults presenting for outpatient psychotherapy. Journal of Child and Adolescent Psychopharmacology, 2, 267-275.

Rezai, K., Andreasen, N.C., Alliger, R., Cohen, G., Swayze, V 2nd, & O'Leary, D.S. (1993). The neuropsychology of the prefrontal cortex. Archives of Neurology, 50, 636-642.

Rosvold, H.E., Szwarcbart, M.K., Mirsky, A.F., & Mishkin, M. (1961). The effect of frontallobe damage on delayed-response performance in chimpanzees. Journal of comparative and Physiological Psychology, 54, 368-374.

Rosvold, H.E., Mirsky, A.F., Sarason, I., Bransome, E.D., & Beck, L.H. (1956). A continuous performance test of brain damage. Journal of Consulting Psychology, 20, 343-350.

Roy-Byrne, P., Scheele, L., Brinkley, J., & Ward, N. (1997). Adult attention-deficit hyperactivity disorder: assessment guidelines based on clinical presentation to a specialty clinic. Comprehensive Psychiatry, 38(3), 133-140.

Sandford, J.A., & Turner, A. (1994). IVA: intermediate visual and auditory continuous performance test. Richmond, VA: Braintrain.

Satterfield, J.H., & Schell, A. (1997). A prospective study of hyperactive boys with conduct problems and normal boys: adolescent and adult criminality. Journal of the American Academy of Child and Adolescent Psychiatry, 36, 1726-1735.

Schaffer, D. (1994). Attention deficit hyperactivity disorder in adults. American Journal of Psychiatry, 151, 633-638.

Sears, W., & Thompson, L. (1998). The a.d.d. book: new understandings, new approaches to parenting your child. Boston: Little, Brown and Co.

Shaw, G.A., & Giambra, L.M. (1993). Task-unrelated thoughts of college students diagnosed as hyperactive in childhood. Developmental Neuropsychology, 9, 17-30.

Shekim, W.O. (1990, Spring/Summer). Adult attention deficit hyperactivity disorder, residual state. CH.A.D.D.ER Newsletter, pp. 16-18.

Shekim, W.O., Antun, F., Hanna, G.L., McCracken, J.T., & Hess, E.B. (1990). S-adensoly-L-methionine (SAM) in adults with ADHD, RE: preliminary results from an open trial. Psyhopharmacology Bulletin, 26, 249-253.

Shelley, A.M., Grochowski, S., Lieberman, J.A., & Javitt, D.C., (1996). Premature disinhibition of P3 generation in schizophrenia. Biological Psychiatry, 39(8), 714-719.

SPSS. (1997). SPSS advanced statistics® 7.5. Chicago: Author.

Strandburg, R.J., Marsh, J.T., Brown, W.S., Asarnow, R.F., Guthrie, D., & Higa, J., (1993). Event-related potentials in high-functioning adult autistics: linguistic and nonlinguistic visual information processing tasks. Neuropsychologia, 31, 413-34.

(1988). Pitfalls in the use of a continuous performance test as a dignostic tool in attention deficit disorder. Developmental and Behaviorl Pediatrics, 9, 339-345.

Valentino, D.A., Arruda, J.E., & Gold, S.M. (1993). Comparison of QEEG and response accuracy in good vs. poorer performers during a vigilance task. International Journal of Psychophysiology, 12, 306-309.

Valentino, D.A., & Dufresne, R.L. (1991). Attention tasks and EEG power spectra. International Journal of Psychophysiology, 11, 299-301.

Verbaten, M.N, Overtoom, C.C., Koelega, H.S., Swaab-Barneveld, H., van-der-Gaag, R.J., Buitelaar, J., & van-Engeland, H. (1994). Methylphenidate influences on both early and late erp waves of adhd children in a continuous performance test. Journal of Abnormal Child Psychology, 22, 561-578.

Weinstein, C. (1994). Cognitive remediation strategies: an adjunct to the psychotherapy of adults with

attention-deficit hyperactivity disorder. Journal of Psychotherapy Practice and Research, 3, 44-57.

Weiss, G., & Hechtman, L. (1986). Hyperactive children grown up. New York: Guilford.

Weiss, G., & Hechtman, L.T. (1993). Hyperactive children grown up (2nd ed.). New York: Guilford.

Weiss, G., Hechtman, L., Milroy, T., & Perlman, T. (1985). Psychiatric status of hyperactives as adults: a controlled prospective 15 year follow-up of 63 hyperactive children. Journal of the American Academy of Child Psychiatry, 23, 211-220.

Weiss, G., Hechtman, L., & Perlman, T. (1978). Hyperactives as young adults: social employer and self-rating scales obtained during ten-year follow-up evaluation. American Journal of Orthopsychiatry, 48, 438-445.

Wender, P.H. (1995). Attention-deficit hyperactivity disorder in adults. New York: Oxford University Press.

Werner, E.E. (1994). Overcoming the odds. Developmental and Behavioral Pediatrics, 15, 131-136.

APPENDICES

Table A-1. Differences in Group Demographics on Screen Measures

Group	Mean	Std. Dev.	t	Sig. (p<)	M Diff
Wender Utah Rating Scale					
ADHD	49.7	7.96	11.601	.001	23.5
Control	26.2	4.32			
Diagnostic Criteria for ADHD, (DSM-IV)					
ADHD	6.75	1.65	9.171	.001	4.5
Control	2.25	1.35			
Brown Attention Deficit Disorder Scale for Adults					
ADHD	49.50	5.92	7.885	.001	14.95
Control	34.55	6.07			

Table A-2. Significant T-Tests: CPT - Visual Stimuli.

Group	Time	Band	Location	Mean	Std. Dev.	t	Sig.	M Diff
ADHD	OM(2)	Theta	F3	5.1160	.3030	3.076	.004	.2674
Control	OM(2)	Theta	F3	4.8487	.2434			
ADHD	OM(2)	Theta	C3	5.0581	.3349	2.639	.012	.2420
Control	OM(2)	Theta	C3	4.8160	.2367			
ADHD	OM(2)	Theta	FZ	5.1547	.0550	2.840	.007	.2611
Control	OM(2)	Theta	FZ	4.8936	.2696			

Table A-3. Significant T-Tests: CPT - Auditory Stimuli.

Group	Time	Band	Location	Mean	Std. Dev.	t	Sig.	M Diff
ADHD	CO(1)	Theta	CZ	4.6583	.2008	-2.770	.009	-.1870
Control	CO(1)	Theta	CZ	4.8453	.2255			
ADHD	OM(1)	Beta	FZ	4.3746	.2468	-2.415	.021	-.1726
Control	OM(1)	Beta	FZ	4.5472	.2031			
ADHD	OM(2)	Alpha	PZ	4.7215	.4747	-2.459	.019	-.3366
Control	OM(2)	Alpha	PZ	5.0581	.3867			

Table A-4. Significant T-Tests: Eyes-Open Baseline.

Group	Time	Band	Location	Mean	Std. Dev.	t	Sig.	M Diff
ADHD	CO(1)	Theta	CZ	4.6191	.2789	-2.708	.010	-.2187
Control	CO(1)	Theta	CZ	4.8373	.2295			
ADHD	OM(1)	Theta	CZ	4.6435	.3644	-2.671	.011	-.2701
Control	OM(1)	Theta	CZ	4.9136	.2677			
ADHD	CO(2)	Theta	CZ	4.6280	.2740	-2.504	.017	-.2098
Control	CO(2)	Theta	CZ	4.8378	.2558			
ADHD	CO(2)	Beta	F3	4.2459	.2285	-2.614	.013	-.1647
Control	CO(2)	Beta	F3	4.4106	.1648			
ADHD	CO(2)	Beta	C3	4.3426	.2025	-2.354	.024	-.1478
Control	CO(2)	Beta	C3	4.4904	.1945			
ADHD	CO(2)	Beta	FZ	4.1915	.3118	-2.640	.012	-.2136
Control	CO(2)	Beta	FZ	4.4051	.1836			
ADHD	CO(2)	Beta	CZ	4.1452	.2725	-3.364	.022	-.2577
Control	CO(2)	Beta	CZ	4.4029	.2077			
ADHD	OM(2)	Beta	FZ	4.2015	.3616	-2.788	.008	-.2711
Control	OM(2)	Beta	FZ	4.4725	.2415			
ADHD	OM(2)	Beta	CZ	4.1984	.2962	-2.473	.018	-.2263
Control	OM(2)	Beta	CZ	4.4247	.2822			

Table A-5. Significant T-Tests: Eyes-Closed Baseline.

Group	Time	Band	Location	Mean	Std. Dev.	t	Sig.	M Diff
ADHD	CO(1)	Alpha	PZ	4.8907	.4091	-2.396	.022	-.3490
Control	CO(1)	Alpha	PZ	5.2397	.5069			
ADHD	OM(1)	Beta	F3	4.3661	.1823	-2.852	.007	-.2114
Control	OM(1)	Beta	F3	4.5774	.2768			
ADHD	OM(1)	Beta	FZ	4.3483	.2301	-2.787	.008	-.2308
Control	OM(1)	Beta	FZ	4.5791	.2900			
ADHD	OM(1)	Beta	CZ	4.3586	.2665	-2.414	.021	-.2341
Control	OM(1)	Beta	CZ	4.5927	.3422			
ADHD	OM(2)	Beta	F3	4.3896	.2230	-2.561	.015	-.2092
Control	OM(2)	Beta	F3	4.5987	.2893			
ADHD	OM(2)	Beta	FZ	4.3528	.2345	-2.998	.005	-.2542
Control	OM(2)	Beta	FZ	4.6070	.2981			
ADHD	OM(2)	Beta	CZ	4.3053	.2550	-3.877	.007	-.2845
Control	OM(2)	Beta	CZ	4.5898	.3613			
ADHD	OM(2)	Beta	PZ	4.3535	.2390	-2.758	.009	-.2711
Control	OM(2)	Beta	PZ	4.6136	.3476			

Table A-6. Correlations Between CPT Performance Change Scores and Eyes-open Baseline Ratios - ADHD.

	CPT Δ	T/B - CZ	A/B - CZ	T/B - FZ	A/B - FZ
CPT Δ					
Pearson	1.000	.493*	.100	.531*	.144
Sig.	•	.027	.673	.016	.543
T/B - CZ					
Pearson		1.000	.288	.629**	.315
Sig.		•	.219	.003	.176
A/B - CZ					
Pearson			1.000	.538*	.730**
Sig.			•	.014	.028
T/B - FZ					
Pearson				1.000	.491*
Sig.				•	.028
A/B - FZ					
Pearson					1.000
Sig.					•

* Correlations significant at the .05 level (2-tailed).
** Correlations significant at the .01 level (2-tailed).
T/B - Theta beta ratio.
A/B - Alpha beta ratio.
Δ - Change.

Table A-7. Correlations Between CPT Performance Change Scores and Eyes-open Baseline Ratios - Controls

	CPT Δ	T/B - CZ	A/B - CZ	T/B - FZ	A/B - FZ
CPT Δ					
Pearson	1.000	.161	.281	.211	.301
Sig.	•	.498	.230	.371	.197
T/B - CZ					
Pearson		1.000	.343	.841**	.373
Sig.		•	.139	.000	.105
A/B - CZ					
Pearson			1.000	.270	.951**
Sig.			•	.249	.000
T/B - FZ					
Pearson				1.000	.388
Sig.				•	.091
A/B - FZ					
Pearson					1.000
Sig.					•

** Correlations significant at the .01 level (2-tailed).
T/B - Theta beta ratio.
A/B - Alpha beta ratio.
Δ - Change.

ANOVA TABLES

Table A-8. ANOVA Tables.

Source	DF	Type III SS	Mean Square	F Value	Pr> F
COND	2.457	66.119	24.413	24.789	.0001
COND*GROUP	2.457	5.281	1.950	1.980	.134
TIME	2.463	9.387	3.811	8.943	.0001
TIME*GROUP	2.463	1.368	.555	1.303	.278
BAND	1.777	555.609	312.777	106.609	.0001
BAND*GROUP	1.776	3.277	1.845	.629	.518
LOCATION	3.555	57.147	16.075	61.116	.0001
LOCATION*GROUP	3.555	4.320	1.215	4.620	.002
COND*TIME	4.606	6.869	1.491	2.378	.045
COND*TIME*GROUP	4.606	3.098	.673	1.073	.375
COND*BAND	3.083	9.796	3.177	6.200	.001
COND*BAND*GROUP	3.083	3.033	.984	1.920	.129
TIME*BAND	4.000	6.572	1.643	6.918	.0001
TIME*BAND*GROUP	4.000	1.925	.481	2.026	.094
COND*TIME*BAND	6.773	4.302	.635	2.828	.008
COND*TIME*BAND*GROUP	6.773	4.221	.623	2.775	.009
COND*LOCATION	2.766	3.148	1.138	4.199	.009
COND*LOCATION*GROUP	2.766	3.098	1.120	4.132	.010
TIME*LOCATION	6.043	.450	7.450E-02	1.147	.336
TIME*LOCATION*GROUP	6.043	.863	.143	2.199	.044

Table A-8. (continued).

Source	DF	Type III SS	Mean Square	F Value	Pr> F
BAND*LOCATION*GROUP	4.446	3.766	.847	4.727	.001
COND*BAND*LOCATION	7.230	1.535	.212	3.071	.004
COND*BAND*LOCATION*GROUP	7.230	1.451	.201	2.904	.005
TIME*BAND*LOCATION	9.790	1.274	.130	3.319	.0001
TIME*BAND*LOCATION*GROUP	9.790	1.247	.127	3.249	.001
COND*TIME*BAND*LOCATION	11.516	1.833	.159	2.245	.010
COND*TIME*BAND*LOCATION*GROUP	11.516	1.908	.166	2.337	.007

SUBJECT DATA

Raw Data from Auditory IVA

Subject	1_1_1*	1_1_2	1_1_3	1_1_4	1_1_5	1_1_6	1_1_7
1	4.868	4.898	4.844	4.890	4.890	4.754	4.762
2	4.745	4.718	4.673	4.787	4.718	4.615	4.615
3	4.875	4.913	4.934	4.949	4.898	4.820	4.820
4	5.118	4.990	4.970	5.220	5.088	4.927	5.030
5	4.585	4.522	4.419	4.635	4.635	4.407	4.500
6	4.890	4.898	5.037	4.970	5.142	5.231	5.004
7	4.500	4.700	4.718	4.691	4.844	4.663	4.682
8	4.860	4.883	4.927	4.984	4.949	4.875	4.836
9	4.477	4.382	4.585	4.605	4.304	4.543	4.369
10	5.182	5.352	5.624	5.247	5.361	5.730	5.136
11	4.382	4.466	4.754	4.489	4.443	4.522	4.419
12	4.796	4.836	4.796	4.890	4.868	4.718	4.663
13	4.771	4.812	4.771	4.868	4.844	4.691	4.635
14	4.949	4.812	4.700	4.984	4.771	4.654	4.787
15	4.890	4.920	4.868	4.913	4.913	4.779	4.787
16	4.844	4.875	4.820	4.868	4.868	4.727	4.736
17	4.787	4.828	4.852	4.868	4.812	4.727	4.727
18	4.820	4.860	4.883	4.898	4.844	4.762	4.762
19	4.419	4.635	4.654	4.625	4.787	4.595	4.615
20	4.615	4.796	4.812	4.787	4.927	4.762	4.779
21	4.431	4.663	4.710	4.543	4.511	4.533	4.605
22	4.605	4.682	4.654	4.615	4.654	4.585	4.779
23	4.745	4.710	4.663	4.836	4.779	4.564	4.787
24	4.533	4.407	4.431	4.585	4.382	4.277	4.419
25	4.654	4.771	4.844	4.710	4.718	4.718	4.575
26	4.779	4.812	4.754	4.804	4.804	4.654	4.663
27	4.977	4.812	4.796	5.024	4.796	4.812	4.920
28	5.056	5.088	5.063	5.094	5.075	4.977	4.913
29	5.130	4.993	4.939	5.153	4.870	4.733	5.025
30	5.007	4.814	4.768	5.050	4.698	4.595	4.877
31	4.727	5.017	4.949	4.828	4.762	4.820	4.852
32	4.533	4.407	4.431	4.585	4.382	4.277	4.419
33	4.407	4.644	4.691	4.522	4.543	4.635	4.575
34	4.419	4.487	4.536	4.531	4.454	4.369	4.625
35	4.796	4.691	4.691	4.787	4.754	4.543	4.700
36	4.418	4.579	4.521	4.631	4.234	4.193	4.605
37	4.920	4.745	4.727	4.970	4.727	4.745	4.860
38	4.771	4.779	4.762	4.796	4.489	4.500	4.635
39	4.762	5.043	4.977	4.860	4.796	4.852	4.883
40	4.963	4.852	4.754	4.997	4.736	4.691	4.736

* Column Headings: A_B_C: A(time): 1=time 1, 2=time2, 3=time3, 4=time4; B(band): 1=theta, 2=alpha, 3=beta; C(location): 1=F3, 2=C3, 3=P3, 4=FZ, 5=CZ , 6=PZ, 7=F4, 8=C4, 9=P4.

Subject	1_1_8	1_1_9	1_2_1	1_2_2	1_2_3	1_2_4	1_2_5
1	4.804	4.682	4.489	4.615	4.625	4.511	4.522
2	4.654	4.511	4.543	4.615	4.682	4.585	4.635
3	4.963	4.852	4.990	5.220	5.541	5.030	5.063
4	4.949	4.812	4.500	4.489	4.533	4.564	4.489
5	4.533	4.431	4.394	4.419	4.635	4.431	4.382
6	5.220	5.198	5.050	5.118	5.193	5.124	5.268
7	4.673	4.522	4.443	4.357	4.595	4.500	4.304
8	4.956	4.844	5.056	5.187	5.521	5.043	5.106
9	4.419	4.754	4.277	4.205	4.263	4.407	4.174
10	5.472	5.700	4.500	4.700	4.898	4.489	4.605
11	4.500	4.700	4.691	4.615	4.407	4.585	4.394
12	4.644	4.477	4.500	4.575	4.644	4.489	4.500
13	4.615	4.443	4.466	4.543	4.615	4.454	4.466
14	4.700	4.533	4.710	4.691	4.779	4.754	4.673
15	4.828	4.710	4.522	4.644	4.654	4.543	4.554
16	4.779	4.654	4.454	4.585	4.595	4.477	4.489
17	4.883	4.762	4.913	5.159	5.497	4.956	4.990
18	4.913	4.796	4.942	5.182	5.513	4.984	5.017
19	4.605	4.443	4.357	4.263	4.522	4.419	4.205
20	4.771	4.635	4.564	4.489	4.700	4.615	4.443
21	4.511	4.543	4.394	4.394	4.331	4.511	4.263
22	4.745	4.595	4.304	4.489	4.700	4.431	4.431
23	4.771	4.615	4.357	4.317	4.369	4.466	4.277
24	4.543	4.522	4.159	4.205	4.443	4.159	4.127
25	4.836	4.718	4.234	4.317	4.419	4.248	4.263
26	4.710	4.575	4.357	4.500	4.511	4.382	4.394
27	4.963	4.868	4.745	5.004	5.394	4.771	4.868
28	5.011	4.934	5.142	5.338	5.624	5.226	5.257
29	4.784	4.944	4.671	4.877	4.887	4.606	4.784
30	4.634	4.773	4.726	4.877	4.944	4.680	4.897
31	4.942	4.796	4.820	5.226	5.493	4.844	5.011
32	4.543	4.522	4.159	4.205	4.443	4.159	4.127
33	4.533	4.543	4.431	4.477	4.248	4.489	4.277
34	4.654	4.394	4.405	4.472	4.741	4.360	4.280
35	4.804	4.595	4.331	4.290	4.317	4.431	4.344
36	4.335	4.394	4.334	4.458	4.631	4.424	3.904
37	4.905	4.804	4.673	4.949	5.357	4.700	4.804
38	4.691	4.575	4.554	4.949	5.485	4.466	4.700
39	4.970	4.828	4.852	5.247	5.509	4.875	5.037
40	4.820	4.595	4.710	4.990	5.347	4.727	4.796

Subject	1_2_6	1_2_7	1_2_8	1_2_9	1_3_1	1_3_2	1_3_3
1	4.522	4.357	4.564	4.477	4.357	4.443	4.394
2	4.718	4.511	4.682	4.585	4.431	4.454	4.466
3	5.442	4.949	5.328	5.576	4.804	4.898	4.890
4	4.443	4.304	4.317	4.382	4.382	4.382	4.431
5	4.575	4.234	4.344	4.654	4.263	4.248	4.304
6	5.347	5.043	5.247	5.323	4.533	4.663	4.804
7	4.533	4.304	4.263	4.595	4.407	4.522	4.331
8	5.412	4.977	5.303	5.587	4.787	4.898	4.890
9	4.220	4.220	4.127	4.263	4.431	4.382	4.277
10	4.860	4.357	4.564	4.771	4.625	4.883	4.990
11	4.344	4.673	4.500	4.443	4.682	4.700	4.554
12	4.511	4.369	4.407	4.369	4.394	4.543	4.635
13	4.477	4.331	4.369	4.331	4.357	4.511	4.605
14	4.779	4.635	4.691	4.605	4.443	4.443	4.454
15	4.554	4.394	4.595	4.511	4.394	4.477	4.431
16	4.489	4.317	4.533	4.443	4.317	4.407	4.357
17	5.394	4.868	5.273	5.533	4.710	4.812	4.804
18	5.412	4.898	5.293	5.549	4.745	4.844	4.836
19	4.454	4.205	4.159	4.522	4.317	4.443	4.234
20	4.644	4.443	4.407	4.700	4.533	4.635	4.466
21	4.094	4.407	4.489	4.331	4.443	4.466	4.454
22	4.533	4.500	4.344	4.174	4.025	4.060	4.111
23	4.190	4.477	4.718	4.466	4.290	4.407	4.382
24	4.248	4.043	4.304	4.466	4.025	4.111	4.443
25	4.317	4.127	4.860	4.718	4.304	4.369	4.369
26	4.394	4.205	4.443	4.344	4.205	4.304	4.248
27	4.963	4.762	5.037	5.088	4.625	4.905	4.984
28	5.485	5.159	5.403	5.631	4.927	4.970	4.956
29	4.617	4.452	4.660	4.573	4.337	4.422	4.657
30	4.814	4.606	4.777	4.680	4.411	4.434	4.728
31	5.075	4.836	5.215	5.384	4.454	4.727	4.820
32	4.248	4.043	4.304	4.466	4.025	4.111	4.443
33	3.912	4.382	4.500	4.234	4.394	4.419	4.419
34	4.700	4.369	4.378	3.892	4.299	4.342	4.388
35	4.143	4.585	4.745	4.477	4.263	4.382	4.357
36	4.468	4.296	4.449	4.554	4.165	3.784	4.188
37	4.905	4.691	4.984	5.037	4.543	4.844	4.927
38	4.745	4.290	4.787	5.050	4.477	4.736	4.868
39	5.100	4.868	5.236	5.403	4.500	4.762	4.852
40	4.868	4.595	5.011	5.136	4.443	4.700	4.868

Subject	1_3_4	1_3_5	1_3_6	1_3_7	1_3_8	1_3_9	2_1_1
1	4.357	4.331	4.263	4.220	4.331	4.277	5.017
2	4.394	4.290	4.357	4.220	4.248	4.290	4.787
3	4.796	4.771	4.718	4.700	4.754	4.804	5.159
4	4.394	4.290	4.277	4.205	4.248	4.290	4.984
5	4.277	4.143	4.220	4.094	4.094	4.248	4.522
6	4.575	4.595	4.762	4.500	4.673	4.852	4.477
7	4.394	4.234	4.190	4.094	4.220	4.357	4.828
8	4.920	4.804	4.754	4.787	4.779	4.828	5.050
9	4.533	4.369	4.466	4.533	4.466	4.357	4.477
10	4.736	5.153	4.860	4.963	5.187	5.204	5.313
11	4.779	4.644	4.625	4.700	4.585	4.489	4.431
12	4.382	4.394	4.466	4.234	4.277	4.317	4.836
13	4.344	4.357	4.431	4.190	4.234	4.277	4.796
14	4.454	4.263	4.331	4.277	4.220	4.248	4.787
15	4.394	4.369	4.304	4.263	4.369	4.317	5.037
16	4.317	4.290	4.220	4.174	4.290	4.234	4.997
17	4.700	4.673	4.615	4.595	4.654	4.710	5.094
18	4.736	4.710	4.654	4.635	4.691	4.745	5.118
19	4.304	4.127	4.078	3.970	4.111	4.263	4.771
20	4.522	4.382	4.344	4.263	4.369	4.489	4.913
21	4.511	4.304	4.331	4.431	4.718	4.431	4.595
22	4.025	3.932	3.989	3.912	3.932	4.007	4.691
23	4.304	4.290	4.174	4.277	4.419	4.234	4.595
24	4.078	4.078	4.234	4.060	4.174	4.369	4.812
25	4.331	4.394	4.331	3.951	4.234	4.234	5.030
26	4.205	4.174	4.094	4.043	4.174	4.111	4.942
27	4.635	4.718	4.736	4.419	4.673	4.644	5.257
28	4.898	4.868	4.762	4.787	4.804	4.812	4.984
29	4.619	4.426	4.445	4.402	4.513	4.459	5.321
30	4.657	4.386	4.539	4.402	4.431	4.473	5.198
31	4.500	4.564	4.554	4.585	4.852	4.796	4.875
32	4.078	4.078	4.234	4.060	4.174	4.369	4.764
33	4.477	4.344	4.454	4.443	4.682	4.466	4.654
34	4.293	4.203	4.255	4.060	4.058	3.611	4.564
35	4.263	4.263	4.220	4.248	4.382	4.263	4.454
36	3.807	3.929	3.912	3.720	3.871	4.234	4.754
37	4.554	4.644	4.663	4.317	4.595	4.564	5.215
38	4.443	4.466	4.575	4.043	4.407	4.554	4.898
39	4.543	4.605	4.595	4.625	4.883	4.828	4.905
40	4.431	4.419	4.511	4.248	4.575	4.673	5.182

Subject	2_1_2	2_1_3	2_1_4	2_1_5	2_1_6	2_1_7	2_1_8
1	5.088	5.056	5.056	5.050	4.977	4.883	4.984
2	4.710	4.625	4.812	4.673	4.595	4.654	4.635
3	5.147	5.112	5.283	5.187	5.056	5.136	5.193
4	4.771	4.820	5.050	4.934	4.754	4.927	4.860
5	4.477	4.443	4.682	4.605	4.419	4.533	4.522
6	4.585	4.700	4.635	4.898	4.852	4.554	4.890
7	4.771	4.700	4.990	4.920	4.682	4.949	4.771
8	5.057	5.023	5.254	5.203	5.138	5.059	5.171
9	4.605	4.852	4.522	4.585	4.852	4.263	4.489
10	5.389	5.429	5.352	5.342	5.361	5.293	5.384
11	4.431	4.779	4.431	4.277	4.635	4.344	4.585
12	4.828	4.771	4.898	4.868	4.710	4.796	4.820
13	4.787	4.727	4.860	4.828	4.663	4.754	4.779
14	4.710	4.673	4.844	4.727	4.654	4.718	4.727
15	5.106	5.075	5.075	5.069	4.997	4.905	5.004
16	5.069	5.037	5.037	5.030	4.956	4.860	4.963
17	5.081	5.043	5.226	5.124	4.984	5.069	5.130
18	5.106	5.069	5.247	5.147	5.011	5.094	5.153
19	4.710	4.635	4.942	4.868	4.615	4.898	4.710
20	4.860	4.796	5.063	4.997	4.779	5.024	4.860
21	4.625	4.615	4.754	4.812	4.575	4.844	4.771
22	4.779	4.736	4.898	4.890	4.644	4.836	4.796
23	4.595	4.500	4.718	4.762	4.466	4.771	4.779
24	4.860	4.860	4.868	4.796	4.635	4.554	4.615
25	5.043	5.112	5.159	5.521	4.913	5.056	5.380
26	5.017	4.984	4.984	4.977	4.898	4.796	4.905
27	5.024	4.927	5.118	4.883	4.898	4.691	4.949
28	5.004	5.030	5.069	4.984	4.913	5.050	5.063
29	5.167	5.035	5.423	5.125	4.996	5.248	4.999
30	4.988	4.863	5.320	4.953	4.857	5.101	4.849
31	4.927	4.905	4.997	4.868	4.913	4.898	4.890
32	4.622	4.670	4.892	4.675	4.577	4.696	4.806
33	4.654	4.595	4.754	4.844	4.644	4.779	4.736
34	4.605	4.605	4.779	4.787	4.489	4.710	4.673
35	4.466	4.331	4.635	4.828	4.263	4.625	4.779
36	4.718	4.727	4.840	4.625	4.477	4.733	4.518
37	4.970	4.868	5.069	4.820	4.836	4.615	4.890
38	4.905	4.875	4.868	4.700	4.762	4.615	4.654
39	4.956	4.934	5.024	4.898	4.942	4.927	4.920
40	5.153	5.100	5.165	4.949	5.011	4.934	5.043

Subject	2_1_9	2_2_1	2_2_2	2_2_3	2_2_4	2_2_5	2_2_6
1	4.875	4.682	4.860	4.787	4.727	4.654	4.663
2	4.533	4.595	4.564	4.654	4.615	4.522	4.625
3	5.024	5.170	5.438	5.704	5.182	5.257	5.549
4	4.771	4.369	4.331	4.489	4.454	4.431	4.454
5	4.419	4.500	4.554	4.828	4.522	4.522	4.828
6	4.920	5.187	5.398	5.268	5.303	5.468	5.690
7	4.615	4.522	4.875	5.263	4.625	4.564	4.990
8	5.075	5.247	5.361	5.704	5.313	5.353	5.678
9	4.771	4.190	4.143	4.248	4.277	4.111	4.205
10	5.375	4.820	4.898	4.956	4.844	4.762	4.898
11	4.934	4.174	4.331	4.466	4.234	4.277	4.382
12	4.654	4.477	4.522	4.625	4.511	4.477	4.511
13	4.605	4.419	4.466	4.575	4.454	4.419	4.454
14	4.522	4.762	4.836	4.927	4.796	4.779	4.927
15	4.898	4.710	4.883	4.812	4.754	4.682	4.691
16	4.852	4.654	4.836	4.762	4.700	4.625	4.635
17	4.949	5.106	5.389	5.666	5.118	5.198	5.505
18	4.977	5.130	5.407	5.680	5.142	5.220	5.521
19	4.543	4.443	4.820	5.226	4.554	4.489	4.942
20	4.718	4.635	4.956	5.318	4.727	4.673	5.063
21	4.644	4.407	4.500	4.700	4.454	4.466	4.625
22	4.605	4.369	4.357	4.489	4.344	4.205	4.190
23	4.635	4.431	4.511	4.673	4.431	4.431	4.522
24	4.533	4.317	4.317	4.466	4.290	4.220	4.317
25	5.357	4.625	4.736	4.745	4.673	4.852	4.828
26	4.787	4.575	4.771	4.691	4.625	4.543	4.554
27	4.796	5.056	5.088	5.220	4.956	4.883	4.927
28	4.934	5.226	5.403	5.700	5.263	5.278	5.568
29	5.176	4.862	5.051	5.070	4.876	5.031	4.883
30	5.004	4.916	5.051	5.127	4.950	5.144	5.080
31	4.700	4.543	4.934	5.165	4.585	4.779	4.796
32	4.799	4.394	4.416	4.674	4.474	4.424	4.530
33	4.564	4.220	4.277	4.615	4.248	4.317	4.454
34	4.431	4.143	4.205	4.449	4.127	4.196	4.438
35	4.644	4.357	4.477	4.615	4.382	4.431	4.394
36	4.357	4.328	4.241	4.562	4.311	3.715	4.415
37	4.727	5.004	5.037	5.176	4.898	4.820	4.868
38	4.635	4.977	5.257	5.442	4.890	5.004	5.011
39	4.736	4.585	4.963	5.187	4.625	4.812	4.828
40	5.088	5.283	5.485	5.778	5.170	5.142	5.187

Subject	2_2_7	2_2_8	2_2_9	2_3_1	2_3_2	2_3_3	2_3_4
1	4.595	5.011	4.828	4.489	4.522	4.477	4.419
2	4.489	4.635	4.564	4.357	4.304	4.331	4.344
3	5.075	5.398	5.587	4.883	4.942	4.956	4.860
4	4.304	4.331	4.543	4.317	4.317	4.431	4.317
5	4.248	4.454	4.828	4.220	4.190	4.290	4.304
6	5.198	5.561	5.298	4.357	4.477	4.554	4.317
7	4.500	4.745	5.056	4.644	4.615	4.700	4.654
8	5.200	5.522	5.822	4.704	4.836	5.073	4.722
9	4.043	4.111	4.234	4.454	4.419	4.394	4.533
10	4.710	4.804	4.890	4.956	5.011	4.820	4.905
11	4.007	4.248	4.489	4.466	4.500	4.431	4.663
12	4.443	4.466	4.466	4.419	4.554	4.673	4.394
13	4.382	4.407	4.407	4.357	4.500	4.625	4.331
14	4.654	4.844	4.754	4.454	4.369	4.357	4.431
15	4.625	5.030	4.852	4.522	4.554	4.511	4.454
16	4.564	4.990	4.804	4.454	4.489	4.443	4.382
17	5.004	5.347	5.545	4.796	4.860	4.875	4.771
18	5.030	5.366	5.561	4.828	4.890	4.905	4.804
19	4.419	4.682	5.011	4.575	4.543	4.635	4.585
20	4.615	4.836	5.124	4.745	4.718	4.796	4.754
21	4.511	4.454	4.533	4.443	4.489	4.585	4.466
22	4.190	4.143	4.174	4.127	4.317	4.554	4.043
23	4.382	4.477	4.585	4.407	4.431	4.522	4.431
24	4.220	4.454	4.543	4.407	4.511	4.466	4.174
25	4.595	5.106	4.898	4.454	4.500	4.431	4.489
26	4.477	4.934	4.736	4.357	4.394	4.344	4.277
27	4.812	4.898	4.990	4.654	4.762	4.727	4.564
28	5.204	5.407	5.638	4.949	4.920	4.942	4.942
29	4.675	4.879	4.808	4.253	4.361	4.839	4.421
30	4.829	4.997	4.915	4.327	4.372	4.911	4.458
31	4.710	4.997	5.030	4.489	4.736	4.663	4.489
32	4.343	4.600	4.747	3.920	4.038	4.433	3.854
33	4.522	4.605	4.317	4.369	4.357	4.543	4.331
34	3.932	4.288	3.932	4.259	4.476	4.570	4.169
35	4.454	4.431	4.522	4.533	4.500	4.554	4.317
36	3.912	4.308	4.620	4.143	4.357	4.220	3.993
37	4.745	4.836	4.934	4.575	4.691	4.654	4.477
38	4.700	5.182	5.313	4.431	4.673	4.682	4.382
39	4.745	5.024	5.056	4.533	4.771	4.700	4.533
40	4.970	5.421	5.649	4.710	4.852	4.898	4.682

Subject	2_3_5	2_3_6	2_3_7	2_3_8	2_3_9	3_1_1	3_1_2
1	4.369	4.331	4.234	4.344	4.263	4.762	4.844
2	4.174	4.234	4.143	4.127	4.205	4.605	4.533
3	4.852	4.796	4.771	4.820	4.796	5.100	5.142
4	4.277	4.344	4.127	4.127	4.317	5.017	4.804
5	4.143	4.190	4.078	4.025	4.143	4.615	4.500
6	4.407	4.431	4.111	4.304	4.419	5.081	5.142
7	4.595	4.533	4.419	4.564	4.543	4.522	4.543
8	4.630	4.530	4.648	4.617	4.677	4.964	4.969
9	4.382	4.277	4.489	4.394	4.419	4.466	4.454
10	4.949	5.030	5.153	5.030	5.024	5.403	5.328
11	4.454	4.205	4.673	4.554	4.304	4.836	4.883
12	4.431	4.511	4.205	4.290	4.344	4.754	4.804
13	4.369	4.454	4.127	4.220	4.277	4.736	4.787
14	4.263	4.290	4.248	4.248	4.277	4.663	4.644
15	4.407	4.369	4.277	4.382	4.304	4.787	4.868
16	4.331	4.290	4.190	4.304	4.220	4.736	4.820
17	4.762	4.700	4.673	4.727	4.700	5.030	5.075
18	4.796	4.736	4.710	4.762	4.736	5.056	5.100
19	4.522	4.454	4.331	4.489	4.466	4.443	4.466
20	4.700	4.644	4.543	4.673	4.654	4.635	4.654
21	4.419	4.533	4.220	4.174	4.331	4.644	4.625
22	4.094	4.263	4.043	4.159	4.290	4.745	4.710
23	4.357	4.394	4.143	4.190	4.382	4.605	4.575
24	4.060	4.143	4.043	4.190	4.407	4.575	4.522
25	4.477	4.443	4.407	4.585	4.595	5.017	5.112
26	4.220	4.174	4.060	4.190	4.094	4.663	4.754
27	4.511	4.554	4.263	4.369	4.419	5.403	5.176
28	4.868	4.836	4.868	4.836	4.820	4.927	4.905
29	4.252	4.222	4.263	4.351	4.308	5.234	5.079
30	4.211	4.316	4.263	4.268	4.322	5.112	4.900
31	4.394	4.454	4.263	4.382	4.443	5.130	5.024
32	3.879	3.986	3.910	4.080	4.359	4.723	4.538
33	4.344	4.595	4.127	4.159	4.331	4.575	4.691
34	4.279	3.970	4.167	4.391	3.989	4.609	4.554
35	4.357	4.443	4.331	4.060	4.331	4.718	4.625
36	3.761	3.912	3.829	3.932	4.220	4.425	4.540
37	4.419	4.466	4.143	4.263	4.317	5.366	5.130
38	4.407	4.500	4.290	4.564	4.625	4.754	4.779
39	4.443	4.500	4.317	4.431	4.489	5.153	5.050
40	4.605	4.644	4.443	4.691	4.710	5.318	5.153

Subject	3_1_3	3_1_4	3_1_5	3_1_6	3_1_7	3_1_8	3_1_9
1	4.820	4.828	4.844	4.754	4.762	4.828	4.736
2	4.533	4.682	4.522	4.489	4.605	4.605	4.533
3	5.142	5.170	5.142	5.056	5.043	5.159	4.997
4	4.727	5.081	4.927	4.700	4.927	4.820	4.710
5	4.431	4.691	4.595	4.407	4.554	4.575	4.522
6	5.434	5.371	5.204	5.398	5.649	5.628	5.583
7	4.595	4.522	4.564	4.477	4.533	4.575	4.466
8	5.023	5.174	5.035	5.058	4.976	5.087	4.993
9	4.466	4.575	4.595	4.431	4.500	4.564	4.477
10	5.652	5.568	5.220	5.602	5.525	5.361	5.460
11	4.934	4.844	4.860	4.828	4.543	4.654	4.564
12	4.754	4.828	4.860	4.710	4.700	4.779	4.605
13	4.736	4.812	4.844	4.691	4.682	4.762	4.585
14	4.595	4.682	4.564	4.533	4.595	4.625	4.522
15	4.844	4.852	4.868	4.779	4.787	4.852	4.762
16	4.796	4.804	4.820	4.727	4.736	4.804	4.710
17	5.075	5.106	5.075	4.984	4.970	5.094	4.920
18	5.100	5.130	5.100	5.011	4.997	5.118	4.949
19	4.522	4.443	4.489	4.394	4.454	4.500	4.382
20	4.700	4.635	4.673	4.595	4.644	4.682	4.585
21	4.543	4.585	4.575	4.331	4.304	4.369	4.357
22	4.644	4.796	4.682	4.489	4.625	4.691	4.595
23	4.543	4.700	4.615	4.344	4.317	4.454	4.489
24	4.543	4.635	4.419	4.382	4.431	4.431	4.419
25	5.159	5.170	5.460	5.165	5.043	5.394	5.333
26	4.727	4.736	4.754	4.654	4.663	4.736	4.635
27	4.984	5.602	5.215	5.236	5.649	5.545	5.460
28	4.963	5.030	4.927	4.852	4.942	4.990	4.949
29	5.035	5.343	4.956	4.916	5.164	4.915	5.093
30	4.863	5.240	4.784	4.777	5.017	4.765	4.922
31	4.860	5.220	4.990	4.949	5.088	5.094	4.905
32	4.605	4.878	4.629	4.554	4.658	4.798	4.784
33	4.575	4.454	4.554	4.431	4.043	4.263	4.394
34	4.500	4.651	4.543	4.357	4.454	4.543	4.466
35	4.654	4.736	4.454	4.477	4.369	4.615	4.654
36	4.576	4.436	4.489	4.121	4.341	4.263	4.174
37	4.927	5.572	5.170	5.193	5.620	5.513	5.425
38	4.682	4.796	4.779	4.787	4.796	4.913	4.868
39	4.890	5.242	5.017	4.977	5.112	5.118	4.934
40	5.215	5.338	5.063	5.081	5.226	5.303	5.347

Subject	3_2_1	3_2_2	3_2_3	3_2_4	3_2_5	3_2_6	3_2_7
1	4.511	4.663	4.673	4.543	4.533	4.654	4.431
2	4.745	4.836	4.997	4.745	4.796	5.050	4.533
3	5.193	5.549	5.765	5.226	5.313	5.595	5.187
4	4.533	4.454	4.522	4.575	4.564	4.533	4.357
5	4.575	4.511	4.796	4.654	4.543	4.804	4.533
6	5.438	5.659	5.533	5.485	5.631	5.580	5.394
7	4.369	4.477	4.625	4.331	4.511	4.710	4.078
8	5.165	5.278	5.621	5.238	5.197	5.594	5.116
9	4.357	4.454	4.745	4.431	4.443	4.736	4.357
10	5.357	5.545	5.802	5.472	5.509	5.872	5.366
11	4.466	4.489	4.585	4.543	4.419	4.543	4.331
12	4.431	4.533	4.615	4.431	4.466	4.511	4.277
13	4.407	4.511	4.595	4.407	4.443	4.489	4.248
14	4.905	5.142	5.412	4.949	5.112	5.412	4.844
15	4.543	4.691	4.700	4.575	4.564	4.682	4.466
16	4.477	4.635	4.644	4.511	4.500	4.625	4.394
17	5.130	5.505	5.730	5.165	5.257	5.553	5.124
18	5.153	5.521	5.743	5.187	5.278	5.568	5.147
19	4.277	4.394	4.554	4.234	4.431	4.644	3.951
20	4.500	4.595	4.727	4.466	4.625	4.804	4.248
21	4.564	4.511	4.466	4.673	4.554	4.394	4.369
22	4.654	4.625	4.419	4.812	4.605	4.407	4.615
23	4.407	4.454	4.533	4.431	4.344	4.382	4.159
24	4.477	4.489	4.369	4.564	4.331	4.190	4.394
25	4.868	4.883	4.836	4.942	5.075	5.043	4.718
26	4.382	4.554	4.564	4.419	4.407	4.543	4.290
27	5.568	5.730	5.753	5.680	5.652	5.606	5.624
28	5.187	5.352	5.617	5.226	5.215	5.513	5.159
29	4.780	4.968	4.987	4.801	4.875	4.799	4.592
30	4.834	4.968	5.044	4.875	4.988	4.996	4.746
31	5.288	5.231	5.278	5.357	5.242	5.106	5.193
32	4.358	4.330	4.633	4.429	4.355	4.509	4.305
33	4.673	4.564	4.511	4.771	4.522	4.443	4.554
34	4.683	4.574	4.166	4.651	4.456	4.314	4.419
35	4.454	4.407	4.654	4.477	4.443	4.407	4.111
36	4.317	4.713	4.248	4.344	4.043	3.850	4.127
37	5.537	5.704	5.727	5.652	5.624	5.576	5.595
38	4.718	4.963	5.298	4.682	4.942	4.927	4.727
39	5.308	5.252	5.298	5.375	5.263	5.130	5.215
40	5.226	5.268	5.460	5.220	5.118	5.147	5.130

Subject	3_2_8	3_2_9	3_3_1	3_3_2	3_3_3	3_3_4	3_3_5
1	4.804	4.700	4.407	4.466	4.489	4.407	4.357
2	4.796	4.920	4.500	4.644	4.394	4.394	4.290
3	5.429	5.620	4.920	4.990	4.956	4.898	4.860
4	4.394	4.431	4.369	4.277	4.382	4.331	4.190
5	4.615	4.883	4.263	4.344	4.344	4.317	4.190
6	5.434	5.670	4.927	5.030	5.198	4.942	5.011
7	4.290	4.700	4.331	4.277	4.331	4.394	4.500
8	5.439	5.727	4.682	4.814	4.763	4.697	4.606
9	4.489	4.718	4.159	4.111	4.205	4.174	4.060
10	5.525	5.733	4.836	4.956	5.056	4.868	4.868
11	4.357	4.522	4.094	4.159	4.317	4.143	4.248
12	4.369	4.407	4.419	4.522	4.635	4.394	4.394
13	4.344	4.382	4.394	4.500	4.615	4.369	4.369
14	5.094	5.130	4.443	4.489	4.543	4.419	4.394
15	4.828	4.727	4.443	4.500	4.522	4.443	4.394
16	4.779	4.673	4.369	4.431	4.454	4.369	4.317
17	5.380	5.580	4.836	4.913	4.875	4.812	4.771
18	5.398	5.595	4.868	4.942	4.905	4.844	4.804
19	4.190	4.635	4.234	4.174	4.234	4.304	4.419
20	4.431	4.796	4.466	4.419	4.466	4.522	4.615
21	4.477	4.489	4.489	4.554	4.575	4.454	4.317
22	4.771	4.585	4.248	4.263	4.357	4.205	4.174
23	4.431	4.522	4.344	4.419	4.500	4.277	4.220
24	4.575	4.466	4.248	4.263	4.331	4.220	4.143
25	4.990	5.011	4.615	4.654	4.762	4.635	4.710
26	4.710	4.595	4.263	4.331	4.357	4.263	4.205
27	5.778	5.835	5.124	5.056	5.030	5.112	4.997
28	5.398	5.700	4.920	4.913	4.905	4.875	4.820
29	4.795	4.712	4.231	4.339	4.529	4.396	4.228
30	4.913	4.820	4.305	4.351	4.600	4.434	4.187
31	5.187	5.024	4.443	4.500	4.625	4.500	4.357
32	4.557	4.717	3.898	4.027	4.292	3.867	3.842
33	4.543	4.710	4.615	4.673	4.615	4.477	4.220
34	4.810	4.466	4.111	3.951	4.078	3.871	3.932
35	4.575	4.635	4.382	4.331	4.575	4.078	4.025
36	4.709	4.234	4.285	4.032	4.094	4.358	3.843
37	5.753	5.811	5.075	5.004	4.977	5.063	4.942
38	5.153	5.268	4.443	4.691	4.844	4.454	4.575
39	5.209	5.050	4.489	4.543	4.663	4.543	4.407
40	5.226	5.371	4.745	4.963	5.017	4.663	4.615

Subject	3_3_6	3_3_7	3_3_8	3_3_9	4_1_1	4_1_2	4_1_3
1	4.369	4.174	4.304	4.304	4.984	5.011	4.934
2	4.369	4.220	4.248	4.263	4.762	4.644	4.564
3	4.828	4.875	4.927	4.913	5.130	5.094	5.124
4	4.290	4.174	4.190	4.234	4.977	4.796	4.804
5	4.263	4.143	4.060	4.220	4.522	4.443	4.443
6	5.204	4.762	4.898	5.088	5.136	5.236	5.283
7	4.511	4.263	4.394	4.615	4.477	4.543	4.564
8	4.505	4.625	4.593	4.654	5.091	5.098	5.166
9	4.127	4.025	4.043	4.127	4.477	4.394	4.344
10	5.056	4.836	4.956	4.997	6.418	5.030	5.024
11	4.248	4.043	4.043	4.234	4.736	4.727	4.644
12	4.466	4.143	4.174	4.277	4.860	4.852	4.796
13	4.443	4.111	4.143	4.248	4.828	4.820	4.762
14	4.500	4.248	4.290	4.331	4.691	4.605	4.554
15	4.407	4.220	4.344	4.344	5.004	5.030	4.956
16	4.331	4.127	4.263	4.263	4.963	4.990	4.913
17	4.736	4.787	4.844	4.828	5.063	5.024	5.056
18	4.771	4.820	4.875	4.860	5.088	5.050	5.081
19	4.431	4.159	4.304	4.543	4.394	4.466	4.489
20	4.625	4.407	4.522	4.718	4.595	4.654	4.673
21	4.419	4.159	4.060	4.060	4.654	4.466	4.317
22	4.220	4.394	4.331	4.357	4.615	4.522	4.575
23	4.174	4.060	4.477	4.477	4.718	4.682	4.615
24	4.143	4.234	4.248	4.317	4.644	4.605	4.605
25	4.762	4.263	4.564	4.654	5.069	5.153	5.283
26	4.220	3.989	4.143	4.143	4.905	4.934	4.852
27	5.063	4.920	5.088	5.136	5.193	5.081	5.004
28	4.796	4.804	4.812	4.860	4.949	4.997	5.043
29	4.197	4.239	4.327	4.285	5.361	5.208	5.179
30	4.291	4.239	4.244	4.298	5.238	5.029	5.007
31	4.454	4.382	4.407	4.533	5.529	5.342	5.187
32	3.973	3.955	4.035	4.318	4.840	4.677	4.731
33	4.382	4.317	3.970	4.025	4.533	4.304	4.043
34	3.892	4.143	4.094	4.863	4.500	4.382	4.443
35	4.143	3.932	4.263	4.382	4.605	4.575	4.477
36	3.892	3.990	3.989	4.094	4.454	4.496	4.443
37	5.011	4.860	5.037	5.088	5.147	5.030	4.949
38	4.585	4.500	4.595	4.663	5.361	5.118	4.949
39	4.500	4.431	4.454	4.575	5.545	5.361	5.209
40	4.605	4.564	4.796	4.970	4.956	5.037	4.970

Subject	4_1_4	4_1_5	4_1_6	4_1_7	4_1_8	4_1_9	4_2_1
1	5.112	5.088	4.883	5.124	5.147	4.963	4.564
2	4.812	4.615	4.522	4.691	4.663	4.511	4.852
3	5.198	5.094	5.037	5.136	5.176	5.100	5.215
4	5.056	4.920	4.779	4.956	4.868	4.787	4.466
5	4.700	4.554	4.407	4.489	4.522	4.466	4.369
6	5.193	5.278	5.313	5.088	5.112	5.030	5.198
7	4.511	4.575	4.522	4.331	4.277	4.511	4.331
8	5.276	5.256	5.175	5.106	5.210	5.122	5.271
9	4.575	4.500	4.344	4.443	4.454	4.407	4.419
10	5.147	5.124	5.030	5.056	5.112	5.088	5.714
11	4.745	4.977	4.736	4.691	4.828	4.736	4.898
12	4.927	4.905	4.718	4.754	4.771	4.595	4.477
13	4.898	4.875	4.682	4.718	4.736	4.554	4.431
14	4.718	4.575	4.500	4.533	4.533	4.454	4.710
15	5.130	5.106	4.905	5.142	5.165	4.984	4.595
16	5.094	5.069	4.860	5.106	5.130	4.942	4.533
17	5.136	5.024	4.963	5.069	5.112	5.030	5.153
18	5.159	5.050	4.990	5.094	5.136	5.056	5.176
19	4.431	4.500	4.443	4.234	4.174	4.431	4.234
20	4.625	4.682	4.635	4.466	4.419	4.625	4.466
21	4.804	4.564	4.331	4.682	4.454	4.357	4.159
22	4.644	4.477	4.443	4.489	4.489	4.477	4.344
23	4.812	4.625	4.382	4.654	4.663	4.466	4.304
24	4.718	4.575	4.431	4.500	4.533	4.500	4.443
25	5.182	5.389	5.298	5.011	5.293	5.352	4.736
26	5.043	5.017	4.796	5.056	5.081	4.883	4.443
27	5.204	4.997	4.984	5.024	5.043	4.898	5.063
28	5.050	5.030	4.963	4.927	5.011	4.977	5.106
29	5.445	5.178	5.033	5.295	5.038	5.222	4.886
30	5.343	5.006	4.895	5.148	4.888	5.051	4.941
31	5.537	5.242	5.209	5.338	5.198	5.037	5.525
32	4.929	4.704	4.620	4.734	4.858	4.858	4.466
33	4.745	4.554	4.220	4.673	4.654	4.382	3.932
34	4.533	4.263	4.263	4.317	4.304	4.234	4.127
35	4.762	4.615	4.220	4.511	4.564	4.220	4.304
36	4.625	4.394	4.290	4.290	4.407	4.290	4.466
37	5.159	4.942	4.927	4.970	4.990	4.836	5.011
38	5.398	4.868	4.942	5.176	5.081	4.868	4.691
39	5.553	5.263	5.231	5.357	5.220	5.063	5.541
40	5.024	4.956	5.037	5.011	5.142	4.927	5.112

Subject	4_2_2	4_2_3	4_2_4	4_2_5	4_2_6	4_2_7	4_2_8
1	4.787	4.804	4.625	4.754	4.762	4.673	5.069
2	4.984	5.011	4.890	4.898	4.990	4.796	4.949
3	5.451	5.717	5.236	5.318	5.557	5.187	5.501
4	4.382	4.543	4.533	4.489	4.489	4.331	4.369
5	4.533	4.796	4.585	4.489	4.804	4.277	4.575
6	5.375	5.273	5.313	5.352	5.602	5.257	5.398
7	4.615	5.056	4.394	4.615	5.063	4.290	4.500
8	5.407	5.764	5.332	5.410	5.716	5.251	5.563
9	4.489	4.710	4.500	4.522	4.820	4.369	4.454
10	5.347	5.288	5.215	5.257	5.318	5.063	5.226
11	4.942	5.375	4.942	4.779	5.268	4.700	5.366
12	4.522	4.615	4.522	4.489	4.533	4.369	4.394
13	4.477	4.575	4.477	4.443	4.489	4.317	4.344
14	4.812	5.011	4.771	4.828	5.037	4.625	4.836
15	4.812	4.828	4.654	4.779	4.787	4.700	5.088
16	4.762	4.779	4.595	4.727	4.736	4.644	5.050
17	5.403	5.680	5.176	5.263	5.513	5.124	5.455
18	5.421	5.694	5.198	5.283	5.529	5.147	5.472
19	4.543	5.011	4.304	4.543	5.017	4.190	4.419
20	4.718	5.124	4.522	4.718	5.130	4.431	4.615
21	4.304	4.419	4.248	4.190	4.290	4.290	4.277
22	4.394	4.407	4.357	4.263	4.394	4.234	4.220
23	4.290	4.344	4.234	4.143	4.220	4.127	4.263
24	4.564	4.489	4.500	4.419	4.369	4.357	4.533
25	4.883	4.875	4.727	4.883	4.920	4.419	4.804
26	4.691	4.710	4.511	4.654	4.663	4.564	4.997
27	5.142	5.220	5.124	5.124	5.182	5.030	5.165
28	5.268	5.464	5.106	5.069	5.236	4.913	5.288
29	5.097	5.130	4.895	5.088	4.922	4.726	4.919
30	5.097	5.187	4.969	5.201	5.118	4.880	5.037
31	5.609	5.775	5.568	5.606	5.521	5.429	5.613
32	4.459	4.720	4.502	4.456	4.568	4.376	4.626
33	4.357	4.344	4.060	4.007	4.078	3.989	4.060
34	4.190	4.277	4.205	4.025	4.159	3.951	3.951
35	4.344	4.477	4.277	4.025	4.317	4.190	4.190
36	4.727	4.394	4.382	4.368	4.159	4.111	4.596
37	5.094	5.176	5.075	5.075	5.136	4.977	5.118
38	4.787	4.718	4.736	4.477	4.533	4.796	4.905
39	5.624	5.787	5.583	5.620	5.537	5.447	5.628
40	5.182	5.361	5.142	5.170	5.106	5.100	5.375

Subject	4_2_9	4_3_1	4_3_2	4_3_3	4_3_4	4_3_5	4_3_6
1	4.898	4.394	4.500	4.500	4.382	4.317	4.331
2	4.820	4.407	4.454	4.419	4.357	4.290	4.304
3	5.697	4.860	4.920	4.875	4.875	4.812	4.736
4	4.500	4.419	4.317	4.407	4.419	4.290	4.304
5	4.820	4.159	4.143	4.248	4.290	4.078	4.174
6	4.875	4.682	4.828	4.883	4.682	4.682	4.796
7	5.209	4.234	4.331	4.673	4.248	4.304	4.595
8	5.860	4.671	4.792	4.763	4.672	4.568	4.492
9	4.787	4.220	4.248	4.159	4.234	4.094	4.094
10	5.308	5.892	5.081	5.037	4.796	4.852	4.949
11	5.572	4.394	4.454	4.700	4.500	4.489	4.663
12	4.382	4.477	4.522	4.605	4.454	4.382	4.431
13	4.331	4.431	4.477	4.564	4.407	4.331	4.382
14	4.836	4.357	4.344	4.357	4.331	4.263	4.317
15	4.920	4.431	4.533	4.533	4.419	4.357	4.369
16	4.875	4.357	4.466	4.466	4.344	4.277	4.290
17	5.659	4.771	4.836	4.787	4.787	4.718	4.635
18	5.673	4.804	4.868	4.820	4.820	4.754	4.673
19	5.170	4.127	4.234	4.605	4.143	4.205	4.522
20	5.268	4.382	4.466	4.771	4.394	4.443	4.700
21	4.369	4.605	4.466	4.394	4.533	4.331	4.248
22	4.382	4.317	4.205	4.290	4.290	4.111	4.220
23	4.304	4.575	4.431	4.394	4.407	4.205	4.205
24	4.522	4.331	4.248	4.290	4.304	4.111	4.111
25	4.771	4.595	4.663	4.635	4.585	4.605	4.625
26	4.812	4.248	4.369	4.369	4.234	4.159	4.174
27	5.198	4.585	4.615	4.700	4.575	4.554	4.663
28	5.580	4.890	4.812	4.820	4.820	4.736	4.615
29	4.846	4.220	4.317	4.529	4.371	4.190	4.184
30	4.953	4.294	4.329	4.600	4.408	4.150	4.278
31	5.670	4.736	5.030	5.153	4.663	4.727	4.736
32	4.770	3.839	3.875	4.280	3.816	3.803	3.919
33	4.127	4.710	4.625	4.431	4.605	4.394	4.304
34	4.262	4.205	4.025	4.143	4.060	3.829	3.932
35	4.466	4.419	4.277	4.220	4.143	4.094	4.190
36	4.681	4.112	4.078	4.111	4.094	3.912	3.784
37	5.153	4.500	4.533	4.625	4.489	4.466	4.585
38	4.762	4.522	4.554	4.500	4.454	4.304	4.369
39	5.684	4.771	5.056	5.176	4.700	4.762	4.771
40	5.468	4.585	4.898	5.043	4.554	4.595	4.595

Subject	4_3_7	4_3_8	4_3_9
1	4.248	4.394	4.357
2	4.174	4.220	4.220
3	4.771	4.796	4.812
4	4.248	4.234	4.304
5	4.007	4.025	4.190
6	4.477	4.663	4.727
7	4.220	4.277	4.644
8	4.601	4.593	4.618
9	4.043	4.060	4.234
10	4.585	4.727	4.868
11	4.477	4.700	4.762
12	4.277	4.205	4.248
13	4.220	4.143	4.190
14	4.174	4.234	4.248
15	4.290	4.431	4.394
16	4.205	4.357	4.317
17	4.673	4.700	4.718
18	4.710	4.736	4.754
19	4.111	4.174	4.575
20	4.369	4.419	4.745
21	4.007	3.912	4.111
22	4.317	4.234	4.357
23	4.263	4.234	4.331
24	4.344	4.263	4.344
25	4.369	4.543	4.564
26	4.078	4.248	4.205
27	4.407	4.605	4.691
28	4.762	4.787	4.796
29	4.215	4.327	4.248
30	4.215	4.244	4.262
31	4.575	4.796	4.970
32	3.825	4.035	4.095
33	4.220	3.584	4.331
34	4.509	4.043	4.190
35	4.205	4.220	4.554
36	4.143	4.043	4.127
37	4.304	4.522	4.615
38	4.277	4.635	4.522
39	4.615	4.828	4.997
40	4.500	4.718	4.913

Raw Data from Visual IVA

Subject	1_1_1	1_1_2	1_1_3	1_1_4	1_1_5	1_1_6	1_1_7
1	4.890	4.920	4.868	4.913	4.913	4.779	4.787
2	4.682	4.654	4.605	4.727	4.654	4.543	4.543
3	4.787	4.844	4.860	4.860	4.836	4.762	4.771
4	5.176	5.056	5.037	5.273	5.147	4.997	5.094
5	4.564	4.489	4.419	4.635	4.615	4.369	4.533
6	5.278	5.273	5.371	5.342	5.323	5.472	5.242
7	4.543	4.564	4.635	4.419	4.700	4.615	4.317
8	4.840	4.863	4.907	4.963	4.929	4.855	4.816
9	4.500	4.419	4.394	4.543	4.489	4.357	4.477
10	5.323	5.323	5.529	5.375	5.242	5.468	5.442
11	4.575	4.736	4.691	4.644	4.860	4.625	4.443
12	4.771	4.812	4.771	4.868	4.844	4.691	4.635
13	4.812	4.812	4.736	4.913	4.852	4.654	4.762
14	4.970	4.836	4.727	5.004	4.796	4.682	4.812
15	4.913	4.942	4.890	4.934	4.934	4.804	4.812
16	4.868	4.898	4.844	4.890	4.890	4.754	4.762
17	4.691	4.754	4.771	4.771	4.745	4.663	4.673
18	4.727	4.787	4.804	4.804	4.779	4.700	4.710
19	4.466	4.489	4.564	4.331	4.635	4.543	4.220
20	4.654	4.673	4.736	4.543	4.796	4.718	4.454
21	4.094	4.357	4.489	4.190	4.344	4.419	4.635
22	4.585	4.662	4.634	4.595	4.634	4.565	4.759
23	4.725	4.689	4.643	4.816	4.759	4.544	4.767
24	4.512	4.387	4.411	4.565	4.362	4.256	4.399
25	4.820	4.883	4.920	4.913	5.094	5.215	4.605
26	4.804	4.836	4.779	4.828	4.828	4.682	4.691
27	5.017	4.970	4.796	5.081	4.875	4.644	4.898
28	4.812	4.883	4.883	4.913	4.905	4.804	4.787
29	5.110	4.973	4.919	5.133	4.850	4.713	5.004
30	4.987	4.794	4.748	5.030	4.678	4.575	4.857
31	4.934	4.963	4.997	4.875	4.905	4.920	4.804
32	4.543	4.417	4.441	4.575	4.372	4.296	4.368
33	4.394	4.477	4.625	4.466	4.477	4.522	4.644
34	4.605	4.635	4.736	4.615	4.522	4.615	4.585
35	4.844	4.890	4.949	4.836	4.804	4.860	4.585
36	4.890	4.913	4.920	4.828	4.796	4.736	4.500
37	4.963	4.913	4.727	5.030	4.812	4.564	4.836
38	4.997	4.934	4.956	5.004	4.898	4.812	4.820
39	4.963	4.990	5.024	4.905	4.934	4.949	4.836
40	4.635	4.700	4.762	4.644	4.615	4.511	4.522

* Column Headings: A_B_C: A(time): 1=time 1, 2=time2, 3=time3, 4=time4; B(band): 1=theta, 2=alpha, 3=beta; C(location): 1=F3, 2=C3, 3=P3, 4=FZ, 5=CZ , 6=PZ, 7=F4, 8=C4, 9=P4.

Subject	1_1_8	1_1_9	1_2_1	1_2_2	1_2_3	1_2_4	1_2_5
1	4.828	4.710	4.522	4.644	4.654	4.543	4.554
2	4.585	4.431	4.466	4.543	4.615	4.511	4.564
3	4.875	4.787	4.905	5.142	5.455	4.920	4.984
4	5.017	4.890	4.605	4.595	4.635	4.663	4.595
5	4.615	4.489	4.382	4.454	4.700	4.407	4.443
6	5.338	5.447	5.389	5.595	5.602	5.434	5.628
7	4.595	4.625	4.344	4.533	5.017	4.317	4.394
8	4.936	4.824	5.036	5.167	5.501	5.023	5.086
9	4.585	4.511	4.477	4.605	4.852	4.443	4.489
10	5.460	5.434	5.278	5.472	5.687	5.278	5.416
11	4.663	4.431	4.357	4.771	5.063	4.369	4.466
12	4.615	4.443	4.466	4.543	4.615	4.454	4.466
13	4.745	4.522	4.454	4.554	4.625	4.477	4.500
14	4.727	4.564	4.736	4.718	4.804	4.779	4.700
15	4.852	4.736	4.554	4.673	4.682	4.575	4.585
16	4.804	4.682	4.489	4.615	4.625	4.511	4.522
17	4.787	4.691	4.820	5.075	5.407	4.836	4.905
18	4.820	4.727	4.852	5.100	5.425	4.868	4.934
19	4.522	4.554	4.248	4.454	4.970	4.220	4.304
20	4.700	4.727	4.477	4.644	5.088	4.454	4.522
21	4.771	4.654	4.304	4.369	4.575	4.344	4.159
22	4.725	4.575	4.284	4.468	4.680	4.411	4.411
23	4.750	4.595	4.337	4.297	4.349	4.446	4.256
24	4.523	4.502	4.139	4.184	4.422	4.139	4.107
25	4.836	4.927	4.543	4.605	4.868	4.635	4.710
26	4.736	4.605	4.394	4.533	4.543	4.419	4.431
27	4.898	4.787	4.762	4.913	5.142	4.673	4.727
28	4.875	4.771	5.075	5.384	5.724	5.106	5.252
29	4.764	4.924	4.651	4.857	4.867	4.586	4.764
30	4.614	4.753	4.705	4.857	4.924	4.660	4.877
31	4.984	4.990	5.069	5.333	5.549	5.147	5.257
32	4.492	4.502	4.169	4.215	4.433	4.149	4.117
33	4.673	4.575	4.277	4.466	4.585	4.234	4.190
34	4.605	4.543	4.357	4.533	4.625	4.431	4.466
35	4.654	4.554	4.625	4.820	4.828	4.615	4.543
36	4.595	4.489	4.644	4.804	4.828	4.625	4.554
37	4.836	4.718	4.691	4.852	5.094	4.595	4.654
38	5.043	5.050	5.050	5.081	5.434	4.990	4.934
39	5.011	5.017	5.094	5.352	5.565	5.170	5.278
40	4.779	4.762	4.710	4.796	5.106	4.700	4.605

Subject	1_2_6	1_2_7	1_2_8	1_2_9	1_3_1	1_3_2	1_3_3
1	4.554	4.394	4.595	4.511	4.394	4.477	4.431
2	4.654	4.431	4.615	4.511	4.344	4.369	4.382
3	5.416	4.890	5.293	5.505	4.615	4.736	4.745
4	4.554	4.431	4.443	4.500	4.500	4.500	4.543
5	4.682	4.317	4.564	4.949	4.220	4.263	4.248
6	5.398	5.323	5.638	5.631	4.779	4.844	5.043
7	4.913	4.060	4.754	5.043	4.234	4.419	4.543
8	5.391	4.957	5.283	5.567	4.767	4.878	4.870
9	4.710	4.317	4.575	4.934	4.234	4.277	4.234
10	5.737	5.283	5.533	5.743	4.868	4.956	5.024
11	4.868	4.331	4.691	4.875	4.317	4.533	4.331
12	4.477	4.331	4.369	4.331	4.357	4.511	4.605
13	4.500	4.431	4.443	4.407	4.394	4.533	4.644
14	4.804	4.663	4.718	4.635	4.477	4.477	4.489
15	4.585	4.431	4.625	4.543	4.431	4.511	4.466
16	4.522	4.357	4.564	4.477	4.357	4.443	4.394
17	5.366	4.804	5.236	5.460	4.500	4.635	4.644
18	5.384	4.836	5.257	5.476	4.543	4.673	4.682
19	4.860	3.932	4.691	4.997	4.127	4.331	4.466
20	4.990	4.234	4.844	5.112	4.382	4.543	4.654
21	4.511	4.543	4.828	4.344	4.263	4.431	4.454
22	4.512	4.480	4.324	4.154	4.005	4.040	4.091
23	4.169	4.457	4.698	4.446	4.270	4.387	4.362
24	4.228	4.023	4.284	4.446	4.005	4.091	4.422
25	4.990	4.443	4.564	4.754	4.394	4.443	4.500
26	4.431	4.248	4.477	4.382	4.248	4.344	4.290
27	4.977	4.700	4.875	4.942	4.533	4.595	4.762
28	5.663	4.970	5.412	5.704	4.754	4.868	4.920
29	4.597	4.432	4.639	4.552	4.316	4.402	4.637
30	4.794	4.586	4.757	4.660	4.390	4.414	4.708
31	5.421	5.112	5.338	5.403	4.682	4.736	4.812
32	4.268	3.992	4.253	4.446	4.035	4.121	4.433
33	4.466	4.635	4.860	4.585	4.190	4.331	4.522
34	4.575	4.595	4.883	4.575	4.511	4.635	4.771
35	4.710	4.595	4.700	4.454	4.779	4.890	4.920
36	4.673	4.564	4.710	4.443	4.836	4.920	4.963
37	4.920	4.625	4.812	4.883	4.443	4.511	4.691
38	5.182	4.905	5.187	5.308	4.522	4.635	4.745
39	5.438	5.136	5.357	5.421	4.718	4.771	4.844
40	4.762	4.554	4.868	4.927	4.615	4.700	4.644

Subject	1_3_4	1_3_5	1_3_6	1_3_7	1_3_8	1_3_9	2_1_1
1	4.394	4.369	4.304	4.263	4.369	4.317	5.037
2	4.304	4.190	4.263	4.111	4.143	4.190	4.727
3	4.635	4.615	4.625	4.595	4.691	4.771	4.963
4	4.511	4.419	4.407	4.344	4.382	4.419	5.011
5	4.220	4.127	4.143	4.078	4.143	4.248	4.533
6	4.796	4.828	5.043	4.605	4.736	4.934	5.323
7	4.290	4.419	4.543	4.220	4.477	4.511	4.615
8	4.900	4.784	4.733	4.767	4.759	4.808	5.030
9	4.159	4.078	4.078	4.007	4.094	4.220	4.564
10	4.828	4.828	4.942	4.663	4.779	4.913	5.412
11	4.344	4.407	4.304	4.220	4.357	4.443	4.585
12	4.344	4.357	4.431	4.190	4.234	4.277	4.796
13	4.369	4.382	4.466	4.159	4.220	4.317	4.710
14	4.489	4.304	4.369	4.317	4.263	4.290	4.828
15	4.431	4.407	4.344	4.304	4.407	4.357	5.056
16	4.357	4.331	4.263	4.220	4.331	4.277	5.017
17	4.522	4.500	4.511	4.477	4.585	4.673	4.883
18	4.564	4.543	4.554	4.522	4.625	4.710	4.913
19	4.190	4.331	4.466	4.111	4.394	4.431	4.543
20	4.431	4.543	4.654	4.369	4.595	4.625	4.718
21	4.234	4.263	4.331	4.431	4.419	4.331	4.615
22	4.005	3.912	3.969	3.892	3.912	3.987	4.776
23	4.284	4.270	4.154	4.256	4.399	4.214	4.915
24	4.057	4.057	4.214	4.040	4.154	4.349	4.703
25	4.419	4.543	4.654	4.248	4.431	4.489	4.812
26	4.248	4.220	4.143	4.094	4.220	4.159	4.963
27	4.454	4.443	4.625	4.654	4.644	4.745	4.977
28	4.779	4.745	4.796	4.691	4.762	4.844	5.303
29	4.599	4.406	4.425	4.382	4.493	4.439	5.300
30	4.637	4.366	4.519	4.382	4.411	4.453	5.178
31	4.585	4.564	4.700	4.710	4.796	4.812	4.949
32	4.067	4.097	4.254	4.009	4.123	4.349	4.774
33	4.174	4.205	4.382	4.357	4.419	4.454	4.419
34	4.500	4.477	4.625	4.394	4.419	4.466	4.025
35	4.754	4.727	4.796	4.174	4.277	4.382	4.691
36	4.779	4.736	4.771	4.143	4.357	4.394	4.771
37	4.357	4.344	4.543	4.575	4.564	4.673	4.920
38	4.443	4.369	4.500	4.595	4.543	4.635	4.977
39	4.625	4.605	4.736	4.745	4.828	4.844	4.977
40	4.419	4.344	4.331	4.615	4.710	4.543	5.136

Subject	2_1_2	2_1_3	2_1_4	2_1_5	2_1_6	2_1_7	2_1_8
1	5.106	5.075	5.075	5.069	4.997	4.905	5.004
2	4.644	4.554	4.754	4.605	4.522	4.585	4.564
3	4.970	4.956	5.037	4.970	4.905	4.890	4.977
4	4.804	4.852	5.075	4.963	4.787	4.956	4.890
5	4.489	4.477	4.533	4.564	4.419	4.431	4.615
6	5.361	5.451	5.371	5.371	5.501	5.283	5.394
7	4.575	4.615	4.691	4.654	4.575	4.575	4.585
8	5.037	5.002	5.233	5.183	5.117	5.039	5.151
9	4.500	4.477	4.635	4.615	4.454	4.489	4.605
10	5.451	5.649	5.476	5.447	5.638	5.714	5.724
11	4.691	4.605	4.644	4.828	4.595	4.454	4.673
12	4.787	4.727	4.860	4.828	4.663	4.754	4.779
13	4.727	4.700	4.796	4.796	4.625	4.625	4.625
14	4.754	4.718	4.883	4.771	4.700	4.762	4.771
15	5.124	5.094	5.094	5.088	5.017	4.927	5.024
16	5.088	5.056	5.056	5.050	4.977	4.883	4.984
17	4.890	4.875	4.963	4.890	4.820	4.804	4.898
18	4.920	4.905	4.990	4.920	4.852	4.836	4.927
19	4.500	4.543	4.625	4.585	4.500	4.500	4.511
20	4.682	4.718	4.787	4.754	4.682	4.682	4.691
21	4.727	4.934	4.595	4.673	4.934	4.682	4.673
22	4.836	4.729	4.865	4.888	4.827	4.982	4.940
23	4.863	4.739	5.086	5.014	4.807	4.990	4.966
24	4.560	4.506	4.835	4.616	4.519	4.622	4.738
25	4.836	5.075	4.956	5.252	5.303	5.063	5.416
26	5.037	5.004	5.004	4.997	4.920	4.820	4.927
27	5.024	4.997	5.004	4.970	4.890	4.977	5.011
28	5.030	4.997	5.342	5.063	4.927	5.347	5.165
29	5.147	5.015	5.403	5.105	4.976	5.227	4.979
30	4.968	4.843	5.300	4.933	4.837	5.080	4.829
31	4.875	4.828	4.927	4.754	4.700	4.905	4.990
32	4.632	4.680	4.882	4.665	4.597	4.645	4.754
33	4.543	4.787	4.394	4.511	4.771	4.615	4.595
34	4.277	4.489	4.043	4.205	4.331	4.407	4.543
35	4.779	4.736	4.898	4.890	4.644	4.836	4.796
36	4.771	4.875	4.754	4.644	4.682	4.511	4.635
37	4.970	4.942	4.949	4.913	4.828	4.920	4.956
38	5.024	4.898	5.043	4.920	4.736	4.771	4.828
39	4.905	4.860	4.956	4.787	4.736	4.934	5.017
40	5.011	4.956	5.069	4.779	4.762	4.927	4.970

Subject	2_1_9	2_2_1	2_2_2	2_2_3	2_2_4	2_2_5	2_2_6
1	4.898	4.710	4.883	4.812	4.754	4.682	4.691
2	4.454	4.522	4.489	4.585	4.543	4.443	4.554
3	4.905	5.198	5.421	5.697	5.170	5.247	5.591
4	4.804	4.419	4.382	4.533	4.500	4.477	4.500
5	4.605	4.804	4.779	5.136	4.804	4.754	5.043
6	5.447	5.407	5.620	5.501	5.447	5.631	5.680
7	4.745	4.419	4.454	4.997	4.522	4.466	4.898
8	5.055	5.227	5.341	5.684	5.293	5.333	5.658
9	4.575	4.489	4.533	4.663	4.500	4.533	4.644
10	5.714	5.323	5.561	5.808	5.338	5.497	5.817
11	4.382	4.382	4.787	5.050	4.382	4.466	4.860
12	4.605	4.419	4.466	4.575	4.454	4.419	4.454
13	4.443	4.394	4.466	4.554	4.419	4.394	4.419
14	4.575	4.804	4.875	4.963	4.836	4.820	4.963
15	4.920	4.736	4.905	4.836	4.779	4.710	4.718
16	4.875	4.682	4.860	4.787	4.727	4.654	4.663
17	4.820	5.136	5.371	5.659	5.106	5.187	5.549
18	4.852	5.159	5.389	5.673	5.130	5.209	5.565
19	4.682	4.331	4.369	4.949	4.443	4.382	4.844
20	4.836	4.543	4.575	5.069	4.635	4.585	4.977
21	4.585	3.932	4.205	4.500	4.060	4.094	4.454
22	4.806	4.474	4.642	4.863	4.681	4.657	4.779
23	4.826	4.527	4.471	4.532	4.716	4.503	4.436
24	4.733	4.329	4.358	4.605	4.409	4.354	4.494
25	5.384	4.585	4.736	4.990	4.727	4.963	5.056
26	4.812	4.605	4.796	4.718	4.654	4.575	4.585
27	4.956	4.890	4.956	5.231	4.934	4.905	5.024
28	5.017	5.268	5.468	5.710	5.242	5.293	5.617
29	5.155	4.841	5.031	5.049	4.856	5.011	4.863
30	4.984	4.896	5.031	5.107	4.930	5.124	5.060
31	4.984	4.905	5.124	5.521	4.977	5.069	5.338
32	4.779	4.404	4.426	4.664	4.464	4.413	4.550
33	4.511	3.989	4.234	4.554	4.025	4.078	4.477
34	4.477	3.951	4.290	4.543	3.989	4.111	4.431
35	4.605	4.369	4.357	4.489	4.344	4.205	4.190
36	4.564	4.357	4.431	4.575	4.304	4.263	4.431
37	4.898	4.828	4.898	5.187	4.875	4.844	4.970
38	4.754	4.963	4.963	5.252	4.942	4.883	5.037
39	5.011	4.934	5.147	5.537	5.004	5.094	5.357
40	5.069	5.050	5.142	5.513	5.043	5.030	5.298

Subject	2_2_7	2_2_8	2_2_9	2_3_1	2_3_2	2_3_3	2_3_4
1	4.625	5.030	4.852	4.522	4.554	4.511	4.454
2	4.407	4.564	4.489	4.263	4.205	4.234	4.248
3	5.037	5.421	5.638	4.828	4.905	4.942	4.860
4	4.357	4.382	4.585	4.369	4.369	4.477	4.369
5	4.635	4.890	5.298	4.394	4.263	4.344	4.357
6	5.375	5.347	5.687	4.779	4.898	5.081	4.804
7	4.407	4.489	5.017	4.290	4.234	4.394	4.331
8	5.180	5.502	5.802	4.684	4.816	5.052	4.701
9	4.382	4.644	4.956	4.143	4.174	4.234	4.111
10	5.338	5.690	5.846	4.852	4.990	5.136	4.844
11	4.369	4.718	4.868	4.357	4.543	4.344	4.382
12	4.382	4.407	4.407	4.357	4.500	4.625	4.331
13	4.234	4.277	4.277	4.263	4.369	4.466	4.248
14	4.700	4.883	4.796	4.511	4.431	4.419	4.489
15	4.654	5.050	4.875	4.554	4.585	4.543	4.489
16	4.595	5.011	4.828	4.489	4.522	4.477	4.419
17	4.963	5.371	5.598	4.736	4.820	4.860	4.771
18	4.990	5.389	5.613	4.771	4.852	4.890	4.804
19	4.317	4.407	4.970	4.190	4.127	4.304	4.234
20	4.533	4.605	5.088	4.431	4.382	4.522	4.466
21	4.511	4.644	4.344	4.511	4.489	4.654	4.477
22	4.703	4.543	4.389	3.922	3.978	4.273	3.807
23	4.680	4.917	4.681	4.187	4.325	4.544	4.085
24	4.246	4.503	4.681	3.922	4.029	4.605	3.859
25	4.771	5.118	5.100	4.382	4.654	4.625	4.454
26	4.511	4.956	4.762	4.394	4.431	4.382	4.317
27	5.100	5.165	5.153	4.727	4.868	4.868	4.625
28	5.176	5.505	5.740	4.828	4.913	4.890	4.828
29	4.655	4.859	4.788	4.233	4.340	4.819	4.400
30	4.809	4.976	4.895	4.307	4.352	4.890	4.438
31	5.037	5.220	5.293	4.585	4.673	4.762	4.454
32	4.292	4.549	4.726	3.930	4.048	4.423	3.844
33	4.615	4.836	4.489	4.443	4.466	4.625	4.407
34	4.585	4.927	4.691	4.043	4.277	4.500	4.007
35	4.190	4.143	4.174	4.127	4.317	4.554	4.043
36	4.190	4.290	4.454	4.575	4.635	4.700	4.554
37	5.050	5.118	5.106	4.654	4.804	4.804	4.543
38	5.030	5.293	5.361	4.700	4.779	4.787	4.605
39	5.063	5.242	5.313	4.625	4.710	4.796	4.500
40	5.088	5.308	5.460	4.771	4.913	4.883	4.595

Subject	2_3_5	2_3_6	2_3_7	2_3_8	2_3_9	3_1_1	3_1_2
1	4.407	4.369	4.277	4.382	4.304	4.787	4.868
2	4.060	4.127	4.025	4.007	4.094	4.533	4.454
3	4.828	4.804	4.745	4.828	4.868	4.963	5.030
4	4.331	4.394	4.190	4.190	4.369	5.004	4.787
5	4.159	4.190	4.159	4.248	4.344	4.575	4.522
6	4.844	5.050	4.654	4.820	5.030	5.680	5.451
7	4.382	4.477	4.277	4.357	4.466	4.511	4.585
8	4.609	4.510	4.628	4.596	4.657	4.944	4.949
9	4.043	4.111	4.007	4.143	4.277	4.543	4.500
10	4.875	5.024	4.644	4.787	4.920	5.398	4.949
11	4.419	4.317	4.234	4.357	4.431	4.771	4.605
12	4.369	4.454	4.127	4.220	4.277	4.736	4.787
13	4.248	4.331	4.127	4.111	4.174	4.779	4.754
14	4.331	4.357	4.317	4.317	4.344	4.682	4.663
15	4.443	4.407	4.317	4.419	4.344	4.812	4.890
16	4.369	4.331	4.234	4.344	4.263	4.762	4.844
17	4.736	4.710	4.644	4.736	4.779	4.883	4.956
18	4.771	4.745	4.682	4.771	4.812	4.913	4.984
19	4.290	4.394	4.174	4.263	4.382	4.431	4.511
20	4.511	4.595	4.419	4.489	4.585	4.625	4.691
21	4.382	4.511	4.344	4.317	4.357	5.220	5.347
22	3.737	3.746	3.753	3.749	3.836	4.689	4.748
23	4.096	3.931	4.117	4.236	4.063	4.829	4.776
24	3.883	3.991	3.901	3.992	4.198	4.617	4.473
25	4.605	4.615	4.407	4.554	4.585	5.017	5.112
26	4.263	4.220	4.111	4.234	4.143	4.691	4.779
27	4.654	4.718	4.852	4.828	4.754	5.011	4.990
28	4.787	4.779	4.779	4.820	4.828	5.236	5.226
29	4.231	4.202	4.242	4.330	4.288	5.214	5.059
30	4.191	4.296	4.242	4.248	4.302	5.091	4.880
31	4.431	4.564	4.595	4.718	4.543	4.898	4.796
32	3.899	4.005	3.858	4.029	4.339	4.733	4.548
33	4.357	4.533	4.543	4.625	4.554	4.357	4.407
34	4.060	4.290	4.344	4.489	4.489	4.407	4.575
35	4.094	4.263	4.043	4.159	4.290	5.333	5.375
36	4.466	4.500	4.220	4.394	4.382	5.384	5.476
37	4.575	4.644	4.787	4.762	4.682	4.956	4.934
38	4.595	4.625	4.905	4.920	4.779	4.898	4.927
39	4.477	4.605	4.635	4.754	4.585	4.927	4.828
40	4.575	4.644	4.644	4.828	4.745	5.242	5.050

Subject	3_1_3	3_1_4	3_1_5	3_1_6	3_1_7	3_1_8	3_1_9
1	4.844	4.852	4.868	4.779	4.787	4.852	4.762
2	4.454	4.615	4.443	4.407	4.533	4.533	4.454
3	5.124	5.037	5.024	5.094	4.920	5.043	5.043
4	4.710	5.069	4.913	4.682	4.913	4.804	4.691
5	4.419	4.605	4.533	4.357	4.477	4.575	4.489
6	5.591	5.545	5.464	5.460	5.313	5.464	5.656
7	4.654	4.454	4.477	4.644	4.533	4.644	4.691
8	5.002	5.154	5.015	5.037	4.956	5.067	4.972
9	4.489	4.615	4.595	4.454	4.522	4.605	4.477
10	4.942	5.533	4.913	4.673	5.561	5.209	4.779
11	4.564	4.787	4.682	4.585	4.564	4.615	4.654
12	4.736	4.812	4.844	4.691	4.682	4.762	4.585
13	4.745	4.844	4.820	4.654	4.691	4.710	4.543
14	4.615	4.700	4.585	4.554	4.615	4.644	4.543
15	4.868	4.875	4.890	4.804	4.812	4.875	4.787
16	4.820	4.828	4.844	4.754	4.762	4.828	4.736
17	5.056	4.963	4.949	5.024	4.836	4.970	4.970
18	5.081	4.990	4.977	5.050	4.868	4.997	4.997
19	4.585	4.369	4.394	4.575	4.454	4.575	4.625
20	4.754	4.575	4.595	4.745	4.644	4.745	4.787
21	5.442	5.247	5.242	5.342	4.700	4.844	4.804
22	4.729	4.786	4.720	4.747	4.899	4.856	4.723
23	4.739	5.007	4.845	4.726	4.907	4.882	4.743
24	4.506	4.755	4.448	4.439	4.538	4.654	4.650
25	5.215	5.100	5.384	5.371	4.796	5.017	5.204
26	4.754	4.762	4.779	4.682	4.691	4.762	4.663
27	5.011	4.890	4.820	4.812	4.990	5.024	4.956
28	5.242	5.352	5.278	5.187	5.257	5.288	5.147
29	5.015	5.323	4.936	4.896	5.144	4.895	5.073
30	4.843	5.220	4.764	4.757	4.997	4.745	4.901
31	4.828	4.852	4.727	4.727	4.934	4.890	4.787
32	4.615	4.868	4.619	4.574	4.607	4.747	4.764
33	4.564	4.431	4.431	4.466	4.290	4.263	4.025
34	4.745	4.466	4.533	4.564	4.220	4.304	4.205
35	5.412	5.338	5.303	5.328	4.595	4.710	4.644
36	5.568	5.366	5.338	5.407	4.644	4.754	4.736
37	4.956	4.828	4.754	4.745	4.934	4.970	4.898
38	4.984	4.727	4.691	4.718	4.736	4.977	5.004
39	4.860	4.883	4.762	4.762	4.963	4.920	4.820
40	4.820	5.257	4.890	4.575	5.124	5.004	4.836

Subject	3_2_1	3_2_2	3_2_3	3_2_4	3_2_5	3_2_6	3_2_7
1	4.543	4.691	4.700	4.575	4.564	4.682	4.466
2	4.682	4.779	4.949	4.682	4.736	5.004	4.454
3	5.165	5.407	5.659	5.187	5.242	5.645	5.100
4	4.511	4.431	4.500	4.554	4.543	4.511	4.331
5	4.454	4.564	4.883	4.466	4.500	4.787	4.317
6	5.252	5.476	5.497	5.204	5.398	5.572	5.037
7	4.357	4.511	4.605	4.443	4.419	4.575	4.644
8	5.145	5.258	5.601	5.218	5.176	5.574	5.096
9	4.554	4.585	4.754	4.564	4.477	4.673	4.466
10	5.460	5.481	5.451	5.434	5.308	5.263	4.977
11	4.489	4.796	5.106	4.522	4.635	4.820	4.466
12	4.407	4.511	4.595	4.407	4.443	4.489	4.248
13	4.477	4.585	4.682	4.511	4.533	4.575	4.331
14	4.920	5.153	5.421	4.963	5.124	5.421	4.860
15	4.575	4.718	4.727	4.605	4.595	4.710	4.500
16	4.511	4.663	4.673	4.543	4.533	4.654	4.431
17	5.100	5.357	5.620	5.124	5.182	5.606	5.030
18	5.124	5.375	5.635	5.147	5.204	5.620	5.056
19	4.263	4.431	4.533	4.357	4.331	4.500	4.575
20	4.489	4.625	4.710	4.564	4.543	4.682	4.745
21	5.100	5.165	5.313	5.182	5.124	5.215	4.718
22	4.393	4.559	4.780	4.605	4.501	4.695	4.619
23	4.445	4.388	4.449	4.640	4.347	4.352	4.597
24	4.248	4.275	4.522	4.333	4.198	4.411	4.163
25	4.654	4.890	5.043	4.796	5.069	5.257	4.644
26	4.419	4.585	4.595	4.454	4.443	4.575	4.331
27	4.956	5.165	5.472	4.927	4.934	5.257	4.868
28	5.318	5.553	5.892	5.352	5.447	5.781	5.481
29	4.760	4.948	4.967	4.781	4.855	4.779	4.572
30	4.814	4.948	5.024	4.855	4.968	4.976	4.726
31	4.644	4.635	5.298	4.644	4.575	5.193	4.745
32	4.368	4.340	4.623	4.419	4.345	4.529	4.253
33	4.663	4.796	4.890	4.635	4.682	4.804	4.060
34	4.585	4.682	4.771	4.585	4.575	4.615	4.111
35	5.094	5.193	5.247	5.118	5.069	5.136	4.605
36	5.112	5.198	5.278	5.112	4.990	5.037	4.691
37	4.898	5.118	5.438	4.868	4.875	5.215	4.804
38	4.963	5.176	5.561	4.990	4.997	5.278	4.934
39	4.682	4.673	5.318	4.682	4.615	5.215	4.779
40	4.727	4.898	5.407	4.804	4.762	5.130	4.990

Subject	3_2_8	3_2_9	3_3_1	3_3_2	3_3_3	3_3_4	3_3_5
1	4.828	4.727	4.443	4.500	4.522	4.443	4.394
2	4.736	4.868	4.419	4.575	4.304	4.304	4.190
3	5.451	5.740	4.852	4.949	4.890	4.860	4.844
4	4.369	4.407	4.344	4.248	4.357	4.304	4.159
5	4.543	4.920	4.174	4.190	4.190	4.159	4.007
6	5.537	5.587	4.898	5.075	5.252	4.920	5.030
7	4.860	5.043	4.585	4.522	4.564	4.691	4.605
8	5.419	5.707	4.662	4.794	4.742	4.677	4.585
9	4.644	4.942	4.357	4.263	4.290	4.331	4.143
10	4.844	4.860	4.691	4.736	4.762	4.682	4.595
11	4.762	4.754	4.304	4.522	4.736	4.234	4.431
12	4.344	4.382	4.394	4.500	4.615	4.369	4.369
13	4.304	4.277	4.317	4.443	4.554	4.277	4.277
14	5.106	5.142	4.466	4.511	4.564	4.443	4.419
15	4.852	4.754	4.477	4.533	4.554	4.477	4.431
16	4.804	4.700	4.407	4.466	4.489	4.407	4.357
17	5.403	5.704	4.762	4.868	4.804	4.771	4.754
18	5.421	5.717	4.796	4.898	4.836	4.804	4.787
19	4.804	4.997	4.511	4.443	4.489	4.625	4.533
20	4.942	5.112	4.691	4.635	4.673	4.787	4.710
21	4.868	4.477	4.984	5.094	5.017	4.913	4.828
22	4.459	4.294	3.900	3.957	3.963	3.782	3.713
23	4.834	4.585	4.165	4.303	4.234	4.061	4.072
24	4.419	4.585	3.900	4.007	4.295	3.834	3.859
25	4.868	5.011	4.344	4.454	4.443	4.419	4.533
26	4.736	4.625	4.304	4.369	4.394	4.304	4.248
27	5.257	5.407	4.754	4.804	4.804	4.700	4.673
28	5.624	5.823	4.956	5.050	5.011	4.970	4.920
29	4.775	4.692	4.211	4.319	4.509	4.376	4.207
30	4.893	4.800	4.285	4.331	4.580	4.413	4.167
31	4.804	5.130	4.844	5.094	5.063	4.875	4.905
32	4.506	4.696	3.907	4.037	4.282	3.857	3.862
33	4.248	4.290	4.344	4.489	4.605	4.344	4.357
34	4.382	4.159	4.331	4.489	4.543	4.290	4.220
35	4.820	4.533	5.176	5.278	5.176	5.112	4.997
36	4.920	4.290	4.942	5.094	5.075	4.949	4.828
37	5.215	5.371	4.682	4.736	4.736	4.625	4.595
38	5.298	5.481	4.736	4.787	4.820	4.625	4.554
39	4.836	5.153	4.875	5.118	5.088	4.905	4.934
40	5.153	5.209	4.905	5.136	5.094	4.860	4.836

Subject	3_3_6	3_3_7	3_3_8	3_3_9	4_1_1	4_1_2	4_1_3
1	4.407	4.220	4.344	4.344	5.004	5.030	4.956
2	4.277	4.111	4.143	4.159	4.700	4.575	4.489
3	4.812	4.762	4.860	4.890	5.130	5.094	5.124
4	4.263	4.143	4.159	4.205	5.004	4.828	4.836
5	4.060	3.970	4.043	4.174	4.533	4.454	4.382
6	5.215	4.754	5.037	5.236	5.043	5.069	5.130
7	4.585	4.787	4.718	4.654	4.500	4.522	4.682
8	4.485	4.605	4.573	4.634	5.071	5.078	5.146
9	4.127	4.174	4.174	4.290	4.543	4.533	4.500
10	4.605	4.382	4.443	4.625	5.226	5.017	5.187
11	4.585	4.111	4.344	4.644	4.710	4.673	4.700
12	4.443	4.111	4.143	4.248	4.828	4.820	4.762
13	4.369	4.143	4.143	4.159	4.754	4.762	4.710
14	4.522	4.277	4.317	4.357	4.736	4.654	4.605
15	4.443	4.263	4.382	4.382	5.024	5.050	4.977
16	4.369	4.174	4.304	4.304	4.984	5.011	4.934
17	4.718	4.663	4.771	4.804	5.063	5.024	5.056
18	4.754	4.700	4.804	4.836	5.088	5.050	5.081
19	4.511	4.727	4.654	4.585	4.419	4.443	4.615
20	4.691	4.875	4.812	4.754	4.615	4.635	4.779
21	4.905	4.443	4.762	4.533	4.382	4.564	4.727
22	3.720	3.729	3.725	3.813	4.816	4.877	4.873
23	3.906	4.094	4.212	4.040	4.956	4.904	4.882
24	3.965	3.878	3.968	4.175	4.744	4.602	4.650
25	4.500	4.205	4.382	4.431	5.037	5.106	5.147
26	4.263	4.043	4.190	4.190	4.927	4.956	4.875
27	4.727	4.522	4.883	4.812	5.226	5.193	5.024
28	4.828	4.934	4.942	4.883	5.231	5.215	5.347
29	4.176	4.219	4.307	4.264	5.341	5.188	5.158
30	4.270	4.219	4.224	4.278	5.218	5.009	4.987
31	4.942	4.860	5.182	4.736	5.056	4.796	4.625
32	3.993	3.904	3.984	4.298	4.850	4.687	4.741
33	4.522	4.304	4.111	4.111	5.434	5.537	5.565
34	4.331	4.159	4.205	4.277	5.628	5.690	5.704
35	5.037	4.605	4.977	4.543	5.525	5.509	5.489
36	4.883	4.466	4.836	4.431	5.568	5.656	5.670
37	4.654	4.431	4.820	4.745	5.182	5.147	4.970
38	4.605	4.522	4.890	4.836	5.030	4.868	4.787
39	4.970	4.890	5.204	4.771	5.081	4.828	4.663
40	4.852	4.890	5.159	4.868	5.088	4.828	4.663

Subject	4_1_4	4_1_5	4_1_6	4_1_7	4_1_8	4_1_9	4_2_1
1	5.130	5.106	4.905	5.142	5.165	4.984	4.595
2	4.754	4.543	4.443	4.625	4.595	4.431	4.796
3	5.198	5.094	5.037	5.136	5.176	5.100	5.215
4	5.081	4.949	4.812	4.984	4.898	4.820	4.511
5	4.644	4.554	4.394	4.477	4.564	4.511	4.454
6	4.990	5.069	5.136	5.371	5.328	5.380	5.142
7	4.466	4.554	4.644	4.431	4.407	4.382	4.317
8	5.256	5.236	5.155	5.086	5.190	5.102	5.251
9	4.615	4.615	4.394	4.489	4.635	4.554	4.654
10	5.081	5.063	5.425	4.977	5.242	5.421	5.030
11	4.654	4.635	4.700	4.407	4.443	4.575	4.190
12	4.898	4.875	4.682	4.718	4.736	4.554	4.431
13	4.820	4.836	4.625	4.663	4.736	4.543	4.344
14	4.762	4.625	4.554	4.585	4.585	4.511	4.754
15	5.147	5.124	4.927	5.159	5.182	5.004	4.625
16	5.112	5.088	4.883	5.124	5.147	4.963	4.564
17	5.136	5.024	4.963	5.069	5.112	5.030	5.153
18	5.159	5.050	4.990	5.094	5.136	5.056	5.176
19	4.382	4.477	4.575	4.344	4.317	4.290	4.220
20	4.585	4.663	4.745	4.554	4.533	4.511	4.454
21	4.369	4.454	4.554	4.127	4.190	4.111	4.533
22	4.888	4.941	4.865	5.029	4.979	4.853	4.499
23	5.109	5.066	4.844	5.037	5.005	4.873	4.552
24	4.857	4.669	4.557	4.669	4.778	4.779	4.354
25	5.170	5.313	5.412	5.056	5.215	5.247	4.317
26	5.063	5.037	4.820	5.075	5.100	4.905	4.477
27	5.308	5.106	4.852	5.153	5.142	5.030	5.124
28	5.313	5.257	5.257	5.187	5.252	5.236	5.521
29	5.425	5.157	5.013	5.274	5.018	5.202	4.866
30	5.322	4.986	4.875	5.127	4.868	5.031	4.921
31	4.927	4.710	4.489	4.727	4.682	4.710	5.069
32	4.919	4.694	4.640	4.682	4.807	4.838	4.476
33	5.468	5.472	5.472	4.331	4.522	4.533	5.231
34	5.642	5.631	5.613	4.443	4.663	4.615	5.273
35	5.517	5.371	5.342	4.554	4.644	4.543	5.004
36	5.602	5.606	5.595	4.419	4.654	4.585	5.318
37	5.268	5.056	4.787	5.106	5.094	4.977	5.075
38	5.050	4.779	4.543	4.920	4.927	4.812	5.011
39	4.956	4.745	4.533	4.762	4.718	4.745	5.094
40	4.920	4.700	4.466	4.710	4.754	4.812	5.118

Subject	4_2_2	4_2_3	4_2_4	4_2_5	4_2_6	4_2_7	4_2_8
1	4.812	4.828	4.654	4.779	4.787	4.700	5.088
2	4.934	4.963	4.836	4.844	4.942	4.736	4.898
3	5.451	5.717	5.236	5.318	5.557	5.187	5.501
4	4.431	4.585	4.575	4.533	4.533	4.382	4.419
5	4.489	4.754	4.466	4.489	4.779	4.357	4.682
6	5.328	5.187	5.081	5.226	5.182	5.004	5.293
7	4.431	4.787	4.369	4.234	4.644	4.290	4.344
8	5.386	5.744	5.312	5.390	5.696	5.230	5.542
9	4.691	4.963	4.663	4.635	4.898	4.554	4.736
10	5.357	5.759	5.011	5.303	5.846	4.860	5.416
11	4.860	5.545	4.263	4.868	5.505	4.595	5.298
12	4.477	4.575	4.477	4.443	4.489	4.317	4.344
13	4.466	4.543	4.369	4.394	4.431	4.234	4.263
14	4.852	5.043	4.812	4.868	5.069	4.673	4.875
15	4.836	4.852	4.682	4.804	4.812	4.727	5.106
16	4.787	4.804	4.625	4.754	4.762	4.673	5.069
17	5.403	5.680	5.176	5.263	5.513	5.124	5.455
18	5.421	5.694	5.198	5.283	5.529	5.147	5.472
19	4.344	4.727	4.277	4.127	4.575	4.190	4.248
20	4.554	4.875	4.500	4.382	4.745	4.431	4.477
21	4.682	4.779	4.585	4.625	4.691	4.159	4.382
22	4.688	4.923	4.700	4.714	4.817	4.753	4.583
23	4.516	4.592	4.735	4.560	4.474	4.731	4.958
24	4.404	4.665	4.428	4.411	4.533	4.297	4.543
25	4.477	4.500	4.369	4.454	4.500	4.344	4.635
26	4.718	4.736	4.543	4.682	4.691	4.595	5.017
27	5.231	5.513	5.142	5.147	5.380	5.069	5.204
28	5.704	5.971	5.468	5.537	5.835	5.394	5.649
29	5.076	5.110	4.875	5.068	4.901	4.706	4.899
30	5.076	5.167	4.949	5.181	5.098	4.860	5.017
31	5.100	5.142	5.043	5.011	5.063	4.905	5.069
32	4.469	4.710	4.492	4.446	4.587	4.325	4.575
33	5.303	5.328	5.209	5.176	5.231	4.511	4.682
34	5.375	5.389	5.252	5.220	5.293	4.554	4.787
35	5.024	5.153	4.860	4.682	5.112	4.682	4.956
36	5.407	5.416	5.293	5.247	5.308	4.554	4.736
37	5.187	5.481	5.094	5.100	5.342	5.017	5.159
38	5.100	5.318	4.984	4.934	5.069	4.977	5.094
39	5.124	5.165	5.069	5.037	5.088	4.934	5.094
40	5.130	5.176	5.043	4.990	5.017	4.890	5.124

Subject	4_2_9	4_3_1	4_3_2	4_3_3	4_3_4	4_3_5	4_3_6
1	4.920	4.431	4.533	4.533	4.419	4.357	4.369
2	4.762	4.317	4.369	4.331	4.263	4.190	4.205
3	5.697	4.860	4.920	4.875	4.875	4.812	4.736
4	4.543	4.466	4.369	4.454	4.466	4.344	4.357
5	5.081	4.094	4.127	4.220	4.111	4.043	4.111
6	5.231	4.804	4.942	5.124	4.852	4.956	5.056
7	4.736	4.317	4.466	4.543	4.317	4.511	4.522
8	5.840	4.651	4.772	4.742	4.651	4.548	4.472
9	5.118	4.220	4.205	4.263	4.174	4.094	4.159
10	5.771	4.745	4.949	5.124	4.787	4.942	5.094
11	5.697	4.290	4.700	4.836	4.290	4.700	4.905
12	4.331	4.431	4.477	4.564	4.407	4.331	4.382
13	4.248	4.304	4.454	4.575	4.290	4.331	4.419
14	4.875	4.419	4.407	4.419	4.394	4.331	4.382
15	4.942	4.466	4.564	4.564	4.454	4.394	4.407
16	4.898	4.394	4.500	4.500	4.382	4.317	4.331
17	5.659	4.771	4.836	4.787	4.787	4.718	4.635
18	5.673	4.804	4.868	4.820	4.820	4.754	4.673
19	4.673	4.220	4.382	4.466	4.220	4.431	4.443
20	4.828	4.454	4.585	4.654	4.454	4.625	4.635
21	4.143	4.263	4.431	4.543	4.234	4.190	4.382
22	4.427	3.889	3.935	3.963	3.757	3.676	3.707
23	4.719	4.154	4.281	4.234	4.035	4.035	3.893
24	4.719	3.889	3.985	4.295	3.809	3.822	3.953
25	4.564	4.407	4.331	4.290	4.454	4.344	4.357
26	4.836	4.290	4.407	4.407	4.277	4.205	4.220
27	5.371	4.736	4.913	4.868	4.691	4.635	4.691
28	5.849	4.905	5.081	4.997	4.942	4.920	4.844
29	4.826	4.200	4.297	4.509	4.350	4.170	4.163
30	4.933	4.274	4.309	4.580	4.388	4.130	4.257
31	5.198	4.522	4.554	4.443	4.369	4.331	4.357
32	4.750	3.849	3.885	4.270	3.806	3.823	3.939
33	4.127	4.997	5.170	5.063	4.984	4.934	4.920
34	4.419	5.100	5.288	5.187	5.094	5.056	5.030
35	4.875	4.977	5.165	5.094	4.942	4.875	4.927
36	4.331	5.094	5.273	5.142	5.069	5.024	5.011
37	5.333	4.663	4.852	4.804	4.615	4.554	4.615
38	5.198	4.605	4.771	4.700	4.443	4.419	4.431
39	5.220	4.564	4.595	4.489	4.419	4.382	4.407
40	5.278	4.605	4.605	4.511	4.394	4.331	4.344

Subject	4_3_7	4_3_8	4_3_9
1	4.290	4.431	4.394
2	4.060	4.111	4.111
3	4.771	4.796	4.812
4	4.304	4.290	4.357
5	3.970	4.094	4.234
6	4.718	4.883	5.063
7	4.234	4.357	4.454
8	4.581	4.573	4.597
9	4.060	4.143	4.263
10	4.554	4.754	4.977
11	4.220	4.605	4.796
12	4.220	4.143	4.190
13	4.043	4.094	4.143
14	4.248	4.304	4.317
15	4.331	4.466	4.431
16	4.248	4.394	4.357
17	4.673	4.700	4.718
18	4.710	4.736	4.754
19	4.127	4.263	4.369
20	4.382	4.489	4.575
21	4.205	4.205	4.248
22	3.705	3.725	3.776
23	4.070	4.212	4.003
24	3.854	3.968	4.139
25	4.304	4.304	4.357
26	4.127	4.290	4.248
27	4.942	4.860	4.736
28	4.875	4.977	4.963
29	4.195	4.307	4.228
30	4.195	4.224	4.242
31	4.543	4.745	4.682
32	3.773	3.984	4.075
33	4.407	4.718	4.304
34	4.394	4.745	4.369
35	4.407	4.913	4.625
36	4.443	4.771	4.454
37	4.883	4.796	4.663
38	4.787	4.836	4.771
39	4.585	4.779	4.718
40	4.522	4.787	4.787

Raw Data from Eyes-closed Baseline.

Subject	1_1_1	1_1_2	1_1_3	1_1_4	1_1_5	1_1_6	1_1_7
1	4.796	4.828	4.774	4.820	4.820	4.673	4.682
2	4.828	4.736	4.727	4.844	4.718	4.654	4.736
3	5.088	5.136	5.182	5.159	5.136	5.094	5.100
4	5.159	4.942	4.913	5.226	4.990	4.828	5.056
5	4.489	4.369	4.394	4.575	4.522	4.394	4.554
6	5.583	5.670	5.384	5.517	5.684	5.680	5.347
7	4.466	4.159	4.489	4.489	4.394	4.277	4.575
8	5.000	5.014	5.058	5.115	5.080	5.006	4.967
9	4.615	4.554	4.654	4.710	4.654	4.625	4.585
10	5.242	5.112	4.990	5.303	5.273	5.198	5.209
11	4.844	5.037	5.220	4.949	5.043	5.037	4.984
12	4.868	4.883	4.796	4.942	4.977	4.754	4.771
13	4.771	4.844	4.844	4.860	4.905	4.804	4.754
14	4.963	4.963	5.030	4.977	4.927	5.011	4.875
15	4.820	4.852	4.796	4.844	4.844	4.700	4.710
16	4.771	4.804	4.745	4.796	4.796	4.644	4.654
17	5.017	5.069	5.118	5.094	5.069	5.024	5.030
18	5.043	5.094	5.142	5.118	5.094	5.050	5.056
19	4.382	4.043	4.407	4.407	4.304	4.174	4.500
20	4.585	4.317	4.605	4.605	4.522	4.419	4.682
21	4.754	4.762	4.710	4.745	4.533	4.443	4.511
22	4.745	4.813	4.785	4.746	4.785	4.716	4.910
23	4.885	4.841	4.794	4.967	4.910	4.695	4.919
24	4.672	4.538	4.562	4.716	4.513	4.408	4.550
25	4.762	4.820	5.017	4.771	4.844	5.081	4.466
26	4.700	4.736	4.673	4.727	4.727	4.564	4.575
27	5.100	5.153	5.118	5.147	5.063	4.673	5.303
28	5.130	5.159	5.198	5.187	5.170	5.124	4.984
29	5.270	5.124	5.071	5.284	5.001	4.864	5.156
30	5.147	4.945	4.899	5.181	4.829	4.726	5.009
31	5.796	5.580	5.323	5.720	5.308	4.812	5.283
32	4.672	4.538	4.562	4.716	4.513	4.408	4.550
33	4.736	4.745	4.691	4.727	4.564	4.554	4.477
34	4.585	4.644	4.682	4.673	4.511	4.419	4.489
35	4.736	4.644	4.644	4.812	4.635	4.564	4.673
36	4.745	4.700	4.754	4.883	4.718	4.543	4.727
37	5.050	5.106	5.069	5.100	5.011	4.595	5.263
38	5.063	5.112	5.100	5.081	4.990	5.024	5.100
39	5.808	5.595	5.342	5.733	5.328	4.844	5.303
40	5.056	4.984	5.037	4.990	4.820	4.787	4.852

* Column Headings: A_B_C: A(time): 1=time 1, 2=time2, 3=time3, 4=time4; B(band): 1=theta, 2=alpha, 3=beta; C(location): 1=F3, 2=C3, 3=P3, 4=FZ, 5=CZ , 6=PZ, 7=F4, 8=C4, 9=P4.

Subject	1_1_8	1_1_9	1_2_1	1_2_2	1_2_3	1_2_4	1_2_5
1	4.727	4.595	4.382	4.522	4.533	4.407	4.419
2	4.710	4.575	5.017	5.088	5.609	5.069	5.100
3	5.215	5.136	5.215	5.416	5.684	5.283	5.357
4	4.875	4.779	4.663	4.522	4.605	4.700	4.625
5	4.543	4.419	4.868	4.990	5.323	4.963	5.030
6	5.513	5.557	5.576	5.525	5.371	5.557	5.533
7	4.615	4.575	4.745	4.754	5.204	4.718	4.804
8	5.104	4.993	5.196	5.318	5.652	5.174	5.237
9	4.635	4.644	5.198	5.333	5.656	5.247	5.380
10	5.371	5.338	5.429	5.642	5.900	5.505	5.645
11	5.263	5.153	5.252	5.737	6.071	5.323	5.613
12	4.804	4.605	4.875	4.920	4.934	4.898	4.920
13	4.875	4.727	4.852	4.860	4.804	4.898	4.875
14	4.956	4.927	4.949	5.081	5.497	4.997	5.088
15	4.754	4.625	4.419	4.554	4.564	4.443	4.454
16	4.700	4.564	4.344	4.489	4.500	4.369	4.382
17	5.153	5.069	5.153	5.366	5.645	5.226	5.303
18	5.176	5.094	5.176	5.384	5.659	5.247	5.323
19	4.543	4.500	4.682	4.691	5.165	4.654	4.745
20	4.718	4.682	4.836	4.844	5.263	4.812	4.890
21	4.454	4.317	4.554	4.635	4.898	4.522	4.454
22	4.893	4.744	4.444	4.620	4.832	4.562	4.562
23	4.919	4.764	4.496	4.449	4.500	4.597	4.408
24	4.692	4.670	4.299	4.336	4.574	4.290	4.258
25	4.700	4.984	4.369	4.419	4.727	4.431	4.500
26	4.625	4.477	4.234	4.394	4.407	4.263	4.277
27	5.398	5.278	5.293	5.624	5.771	5.357	5.472
28	5.112	5.088	5.037	5.209	5.283	5.024	5.106
29	4.932	5.093	4.811	5.009	5.018	4.737	4.915
30	4.782	4.922	4.865	5.009	5.076	4.811	5.028
31	5.142	4.942	5.170	5.403	5.775	5.193	5.338
32	4.692	4.670	4.299	4.336	4.574	4.290	4.258
33	4.477	4.317	4.585	4.700	4.852	4.500	4.466
34	4.419	4.344	4.533	4.605	4.868	4.500	4.431
35	4.543	4.635	4.466	4.710	5.081	4.543	4.663
36	4.595	4.554	4.710	4.956	5.303	4.673	4.844
37	5.361	5.236	5.252	5.595	5.746	5.318	5.438
38	5.187	5.056	5.361	5.606	5.756	5.438	5.472
39	5.165	4.970	5.193	5.421	5.787	5.215	5.357
40	5.081	5.030	5.366	5.541	5.649	5.371	5.442

Subject	1_2_6	1_2_7	1_2_8	1_2_9	1_3_1	1_3_2	1_3_3
1	4.419	4.234	4.466	4.369	4.234	4.331	4.277
2	5.613	4.927	5.106	5.606	4.443	4.466	4.635
3	5.602	5.298	5.565	5.740	4.883	4.990	5.050
4	4.625	4.489	4.477	4.828	4.394	4.357	4.466
5	5.215	4.844	4.949	5.081	4.205	4.277	4.477
6	5.429	5.635	5.687	5.697	5.024	5.024	5.153
7	5.170	4.554	4.771	5.389	4.718	4.663	4.710
8	5.543	5.108	5.452	5.736	4.927	5.029	5.021
9	5.673	5.063	5.293	5.572	4.277	4.331	4.489
10	6.059	5.517	5.841	6.142	4.836	4.913	5.043
11	5.986	5.011	5.380	5.787	4.796	5.081	5.257
12	4.913	4.771	4.868	4.875	4.477	4.575	4.625
13	4.727	4.779	4.820	4.700	4.407	4.511	4.554
14	5.485	4.898	5.118	5.412	4.431	4.454	4.522
15	4.454	4.277	4.500	4.407	4.277	4.369	4.317
16	4.382	4.190	4.431	4.331	4.190	4.290	4.234
17	5.561	5.242	5.521	5.704	4.796	4.913	4.977
18	5.576	5.263	5.537	5.717	4.828	4.942	5.004
19	5.130	4.477	4.710	5.357	4.654	4.595	4.644
20	5.231	4.663	4.860	5.438	4.812	4.762	4.804
21	4.898	4.277	4.357	5.030	4.543	4.585	4.511
22	4.664	4.631	4.492	4.323	4.165	4.191	4.242
23	4.321	4.608	4.867	4.614	4.430	4.538	4.513
24	4.380	4.174	4.452	4.614	4.165	4.242	4.574
25	4.771	4.431	4.533	4.844	3.989	4.205	4.407
26	4.277	4.060	4.331	4.220	4.060	4.174	4.111
27	4.890	5.557	5.714	5.680	4.736	4.852	4.970
28	5.106	4.860	5.100	5.130	4.836	4.890	4.836
29	4.748	4.583	4.808	4.721	4.476	4.553	4.788
30	4.945	4.737	4.926	4.829	4.550	4.565	4.859
31	5.690	5.100	5.380	5.497	4.564	4.890	4.890
32	4.380	4.174	4.452	4.614	4.165	4.242	4.574
33	4.820	4.248	4.369	4.984	4.500	4.543	4.477
34	4.812	4.277	4.522	5.081	4.407	4.443	4.489
35	5.204	4.443	4.595	5.043	4.615	4.407	4.511
36	5.347	4.382	4.635	5.081	4.304	4.369	4.663
37	4.828	5.525	5.687	5.652	4.663	4.787	4.913
38	4.727	5.501	5.663	5.624	4.745	4.868	5.050
39	5.704	5.124	5.398	5.513	4.605	4.920	4.920
40	5.303	5.398	5.620	5.572	4.511	4.787	4.934

Subject	1_3_4	1_3_5	1_3_6	1_3_7	1_3_8	1_3_9	2_1_1
1	4.234	4.205	4.127	4.078	4.205	4.143	4.956
2	4.443	4.419	4.595	4.304	4.369	4.615	4.868
3	4.890	4.934	4.934	4.736	4.883	4.920	5.130
4	4.382	4.344	4.382	4.174	4.159	4.419	5.050
5	4.248	4.190	4.357	4.143	4.190	4.369	4.605
6	4.942	4.970	5.209	4.820	5.017	5.153	4.970
7	4.673	4.710	4.745	4.454	4.407	4.644	4.543
8	5.051	4.935	4.885	4.936	4.928	4.977	5.190
9	4.304	4.290	4.407	4.159	4.234	4.431	4.585
10	4.875	4.956	5.147	4.554	4.796	5.069	5.677
11	4.875	5.043	5.242	4.635	4.934	5.081	4.956
12	4.431	4.443	4.489	4.220	4.248	4.277	4.663
13	4.394	4.369	4.394	4.190	4.220	4.205	4.771
14	4.407	4.357	4.443	4.220	4.290	4.357	4.898
15	4.277	4.248	4.174	4.127	4.248	4.190	4.977
16	4.190	4.159	4.078	4.025	4.159	4.094	4.934
17	4.804	4.852	4.852	4.635	4.796	4.836	5.063
18	4.836	4.883	4.883	4.673	4.828	4.868	5.088
19	4.605	4.644	4.682	4.369	4.317	4.575	4.466
20	4.771	4.804	4.836	4.575	4.533	4.745	4.654
21	4.554	4.511	4.500	4.304	4.290	4.511	4.489
22	4.156	4.063	4.120	4.060	4.080	4.156	4.936
23	4.435	4.421	4.305	4.425	4.567	4.383	5.075
24	4.209	4.209	4.365	4.209	4.323	4.518	4.863
25	3.932	4.143	4.331	3.912	3.970	4.190	4.942
26	4.060	4.025	3.932	3.871	4.025	3.951	4.875
27	4.700	4.727	5.094	4.625	4.868	4.984	5.357
28	4.844	4.812	4.700	4.635	4.718	4.691	5.153
29	4.750	4.557	4.576	4.550	4.661	4.607	5.460
30	4.788	4.517	4.670	4.550	4.579	4.621	5.338
31	4.543	4.682	4.860	4.543	4.883	4.844	5.288
32	4.209	4.209	4.365	4.209	4.323	4.518	4.903
33	4.522	4.543	4.605	4.317	4.234	4.543	4.554
34	4.394	4.304	4.357	4.190	4.190	4.489	4.454
35	4.663	4.304	4.500	4.419	4.143	4.489	4.663
36	4.111	4.127	4.511	4.078	4.263	4.595	4.625
37	4.625	4.654	5.043	4.543	4.804	4.927	5.318
38	4.727	4.779	4.787	4.585	4.868	5.011	5.236
39	4.585	4.718	4.890	4.585	4.913	4.875	5.308
40	4.477	4.554	4.927	4.431	4.736	4.745	5.464

Subject	2_1_2	2_1_3	2_1_4	2_1_5	2_1_6	2_1_7	2_1_8
1	5.030	4.997	4.997	4.990	4.913	4.812	4.920
2	4.934	4.890	4.898	4.860	4.852	4.820	4.868
3	5.130	5.147	5.215	5.159	5.100	5.130	5.226
4	4.852	4.796	5.136	4.963	4.771	5.043	4.890
5	4.564	4.575	4.682	4.663	4.564	4.575	4.595
6	5.124	5.447	5.176	5.313	5.631	5.366	5.505
7	4.625	4.700	4.575	4.718	4.605	4.443	4.710
8	5.188	5.154	5.385	5.334	5.269	5.190	5.319
9	4.543	4.635	4.718	4.595	4.564	4.615	4.625
10	5.897	6.026	5.561	5.652	5.919	5.846	5.645
11	4.977	4.898	4.984	4.920	4.844	4.787	4.844
12	4.754	4.745	4.727	4.779	4.663	4.595	4.727
13	4.852	4.860	4.828	4.883	4.812	4.700	4.804
14	4.913	4.977	4.934	4.875	4.977	4.828	4.852
15	5.050	5.017	5.017	5.011	4.934	4.836	4.942
16	5.011	4.977	4.977	4.970	4.890	4.787	4.898
17	5.063	5.081	5.153	5.094	5.030	5.063	5.165
18	5.088	5.106	5.176	5.118	5.056	5.088	5.187
19	4.554	4.635	4.500	4.654	4.533	4.357	4.644
20	4.727	4.796	4.682	4.812	4.710	4.564	4.804
21	4.466	4.477	4.625	4.533	4.419	4.635	4.554
22	4.987	4.880	5.016	5.040	4.978	5.133	5.108
23	5.015	4.890	5.237	5.165	4.958	5.142	5.134
24	4.712	4.657	4.986	4.768	4.670	4.773	4.907
25	5.100	5.278	4.970	5.130	5.371	4.787	5.081
26	4.956	4.920	4.920	4.913	4.828	4.718	4.836
27	5.313	5.263	5.421	5.328	5.236	5.338	5.384
28	5.236	5.176	5.273	5.380	5.220	5.124	5.268
29	5.298	5.166	5.554	5.256	5.127	5.379	5.147
30	5.119	4.994	5.451	5.084	4.988	5.232	4.997
31	5.063	4.942	5.361	4.970	5.159	5.226	5.069
32	4.753	4.801	5.023	4.806	4.708	4.828	4.954
33	4.500	4.454	4.625	4.575	4.500	4.554	4.511
34	4.357	4.357	4.564	4.263	4.248	4.554	4.394
35	4.575	4.644	4.771	4.575	4.605	4.533	4.477
36	4.585	4.635	4.673	4.543	4.466	4.595	4.745
37	5.273	5.220	5.384	5.288	5.193	5.298	5.347
38	5.004	4.860	5.371	4.927	4.956	5.056	4.970
39	5.088	4.970	5.380	4.997	5.182	5.247	5.094
40	5.215	5.198	5.521	5.147	5.226	5.481	5.347

Subject	2_1_9	2_2_1	2_2_2	2_2_3	2_2_4	2_2_5	2_2_6
1	4.804	4.595	4.787	4.710	4.644	4.564	4.575
2	4.710	5.100	5.303	5.730	5.136	5.303	5.749
3	5.147	5.153	5.357	5.663	5.176	5.226	5.533
4	4.787	4.585	4.595	4.673	4.691	4.700	4.673
5	4.533	5.030	5.147	5.472	5.112	5.204	5.442
6	5.572	5.384	5.537	5.545	5.509	5.565	5.384
7	4.564	4.949	5.118	5.236	4.920	4.913	5.050
8	5.224	5.387	5.492	5.835	5.444	5.484	5.809
9	4.543	5.226	5.394	5.694	5.288	5.447	5.670
10	5.707	5.707	6.014	6.246	5.505	5.690	6.182
11	4.700	4.277	4.522	4.812	4.344	4.605	4.804
12	4.595	4.762	4.804	4.812	4.820	4.836	4.812
13	4.700	4.771	4.812	4.836	4.804	4.804	4.754
14	4.905	4.605	4.663	4.787	4.635	4.595	4.745
15	4.828	4.625	4.812	4.736	4.673	4.595	4.605
16	4.779	4.564	4.762	4.682	4.615	4.533	4.543
17	5.081	5.088	5.303	5.624	5.112	5.165	5.489
18	5.106	5.112	5.323	5.638	5.136	5.187	5.505
19	4.489	4.898	5.075	5.198	4.868	4.860	5.004
20	4.673	5.024	5.182	5.293	4.997	4.990	5.118
21	4.443	4.820	4.949	5.220	4.836	4.868	5.288
22	4.975	4.634	4.794	5.014	4.832	4.809	4.930
23	4.995	4.687	4.622	4.683	4.867	4.655	4.587
24	4.901	4.489	4.510	4.756	4.560	4.505	4.646
25	5.323	4.663	4.890	5.037	4.663	4.762	5.088
26	4.710	4.477	4.691	4.605	4.533	4.443	4.454
27	5.242	5.421	5.580	5.746	5.468	5.533	4.990
28	5.136	4.860	4.997	5.069	4.852	4.875	4.956
29	5.324	5.001	5.182	5.201	5.007	5.162	5.014
30	5.153	5.056	5.182	5.258	5.081	5.275	5.211
31	4.860	5.142	5.278	5.501	5.170	5.176	4.762
32	4.948	4.534	4.547	4.805	4.605	4.555	4.661
33	4.344	4.605	4.727	5.170	4.654	4.771	5.412
34	4.407	4.984	4.956	4.990	5.011	4.804	5.056
35	4.625	4.234	4.407	4.673	4.344	4.407	4.890
36	4.718	4.454	4.575	4.898	4.454	4.533	4.956
37	5.198	5.384	5.549	5.720	5.434	5.501	4.934
38	4.745	5.198	5.447	5.557	5.257	5.313	5.257
39	4.890	5.165	5.298	5.517	5.193	5.198	4.796
40	5.220	5.182	5.293	5.583	5.247	5.226	5.247

Subject	2_2_7	2_2_8	2_2_9	2_3_1	2_3_2	2_3_3	2_3_4
1	4.500	4.949	4.754	4.382	4.419	4.369	4.304
2	5.030	5.366	5.677	4.511	4.585	4.673	4.511
3	5.124	5.380	5.517	4.934	5.004	5.024	4.956
4	4.564	4.554	4.771	4.419	4.443	4.605	4.407
5	4.913	5.081	5.283	4.277	4.277	4.477	4.331
6	5.460	5.521	5.380	4.868	5.075	5.288	4.920
7	4.489	5.252	5.380	4.771	4.787	4.905	4.771
8	5.331	5.671	5.971	4.844	4.967	5.204	4.853
9	5.075	5.278	5.429	4.263	4.317	4.533	4.331
10	5.460	5.737	6.100	5.030	5.159	5.283	5.056
11	4.407	4.543	4.533	4.220	4.304	4.466	4.263
12	4.673	4.779	4.736	4.344	4.443	4.522	4.344
13	4.691	4.787	4.754	4.344	4.477	4.533	4.290
14	4.454	4.554	4.682	4.277	4.304	4.344	4.290
15	4.533	4.970	4.779	4.419	4.454	4.407	4.344
16	4.466	4.927	4.727	4.344	4.382	4.331	4.263
17	5.056	5.328	5.472	4.852	4.927	4.949	4.875
18	5.081	5.347	5.489	4.883	4.956	4.977	4.905
19	4.407	5.215	5.347	4.710	4.727	4.852	4.710
20	4.605	5.308	5.429	4.860	4.875	4.984	4.860
21	4.625	4.787	5.136	4.394	4.394	4.500	4.466
22	4.854	4.711	4.558	4.082	4.130	4.424	3.958
23	4.832	5.086	4.849	4.347	4.476	4.695	4.237
24	4.397	4.672	4.849	4.082	4.180	4.756	4.010
25	4.466	4.745	5.037	4.344	4.466	4.477	4.357
26	4.369	4.868	4.654	4.234	4.277	4.220	4.143
27	5.352	5.497	5.489	4.466	4.977	5.447	4.431
28	4.828	4.990	4.970	4.718	4.836	4.787	4.762
29	4.806	5.027	4.956	4.393	4.492	4.970	4.552
30	4.960	5.145	5.064	4.467	4.503	5.042	4.589
31	5.112	5.278	5.352	4.554	4.804	4.860	4.533
32	4.474	4.749	4.895	4.060	4.169	4.564	3.985
33	4.635	4.898	5.384	4.317	4.248	4.454	4.331
34	4.718	4.796	5.004	4.220	4.317	4.443	4.094
35	4.369	4.605	5.017	4.234	4.317	4.431	4.205
36	4.466	4.710	5.100	4.317	4.382	4.533	4.304
37	5.313	5.464	5.455	4.369	4.920	5.412	4.331
38	5.375	5.580	5.521	4.533	5.037	5.303	4.500
39	5.136	5.298	5.371	4.595	4.836	4.890	4.575
40	5.153	5.352	5.489	4.595	4.920	5.081	4.605

Subject	2_3_5	2_3_6	2_3_7	2_3_8	2_3_9	3_1_1	3_1_2
1	4.248	4.205	4.094	4.220	4.127	4.682	4.771
2	4.511	4.673	4.357	4.466	4.585	4.745	4.762
3	5.063	4.984	4.771	4.927	4.963	5.209	5.268
4	4.344	4.477	4.304	4.263	4.443	4.927	4.771
5	4.234	4.344	4.143	4.220	4.407	4.533	4.500
6	5.030	5.242	4.625	4.787	5.050	5.533	5.638
7	4.828	4.934	4.511	4.905	4.977	4.860	4.820
8	4.761	4.661	4.797	4.765	4.826	5.104	5.100
9	4.290	4.443	4.159	4.174	4.382	4.554	4.543
10	5.112	5.263	4.804	5.030	5.231	5.595	5.631
11	4.407	4.394	4.111	4.205	4.248	4.700	4.905
12	4.331	4.394	4.094	4.127	4.127	4.779	4.883
13	4.304	4.344	4.143	4.205	4.190	4.771	4.860
14	4.205	4.304	4.205	4.277	4.369	4.718	4.663
15	4.290	4.248	4.143	4.263	4.174	4.710	4.796
16	4.205	4.159	4.043	4.174	4.078	4.654	4.745
17	4.990	4.905	4.673	4.844	4.883	5.147	5.209
18	5.017	4.934	4.710	4.875	4.913	5.170	5.231
19	4.771	4.883	4.431	4.852	4.927	4.804	4.762
20	4.913	5.011	4.625	4.984	5.050	4.942	4.905
21	4.331	4.466	4.304	4.277	4.500	4.635	4.564
22	3.889	3.897	3.921	3.918	4.005	4.849	4.899
23	4.247	4.082	4.286	4.405	4.232	4.989	4.927
24	4.034	4.142	4.070	4.160	4.367	4.777	4.624
25	4.466	4.431	4.159	4.357	4.419	5.257	5.476
26	4.078	4.025	3.892	4.043	3.932	4.575	4.673
27	4.710	5.257	4.443	4.635	4.997	4.836	4.718
28	4.820	4.745	4.625	4.700	4.700	5.118	5.112
29	4.383	4.353	4.411	4.499	4.457	5.374	5.210
30	4.342	4.447	4.411	4.417	4.470	5.251	5.031
31	4.543	4.745	4.382	4.745	4.771	5.545	5.366
32	4.010	4.117	4.058	4.228	4.508	4.863	4.669
33	4.248	4.533	4.220	4.263	4.500	4.564	4.635
34	4.111	4.344	4.060	4.205	4.431	4.727	4.682
35	4.143	4.431	4.078	4.317	4.682	4.454	4.533
36	4.290	4.454	4.159	4.331	4.605	4.522	4.554
37	4.635	5.215	4.344	4.554	4.942	4.771	4.644
38	4.635	4.844	4.431	4.654	4.868	5.468	5.063
39	4.585	4.779	4.431	4.779	4.804	5.561	5.384
40	4.673	4.691	4.466	4.875	4.913	5.247	5.176

Subject	3_1_3	3_1_4	3_1_5	3_1_6	3_1_7	3_1_8	3_1_9
1	4.745	4.754	4.771	4.673	4.682	4.754	4.654
2	4.804	4.787	4.736	4.804	4.691	4.779	4.762
3	5.298	5.288	5.429	5.361	5.170	5.361	5.328
4	4.836	5.011	4.890	4.852	4.898	4.812	4.796
5	4.605	4.625	4.585	4.533	4.522	4.543	4.543
6	5.412	5.407	5.472	5.694	5.283	5.371	5.460
7	4.820	4.860	4.963	4.718	4.727	4.787	4.625
8	5.154	5.305	5.166	5.189	5.107	5.235	5.141
9	4.691	4.605	4.663	4.673	4.533	4.635	4.673
10	5.869	5.580	5.529	5.841	5.380	5.398	5.673
11	4.920	4.787	5.011	4.905	4.500	4.727	4.691
12	4.927	4.820	4.898	4.913	4.727	4.860	4.804
13	4.836	4.875	4.920	4.779	4.691	4.796	4.654
14	4.673	4.754	4.691	4.682	4.727	4.771	4.710
15	4.771	4.779	4.796	4.700	4.710	4.779	4.682
16	4.718	4.727	4.745	4.644	4.654	4.727	4.625
17	5.242	5.231	5.380	5.308	5.106	5.308	5.273
18	5.263	5.252	5.398	5.328	5.130	5.328	5.293
19	4.762	4.804	4.913	4.654	4.663	4.727	4.554
20	4.905	4.942	5.037	4.812	4.820	4.875	4.727
21	4.564	4.804	4.625	4.407	4.736	4.635	4.407
22	4.880	4.937	4.871	4.898	5.050	5.024	4.892
23	4.890	5.158	4.996	4.878	5.058	5.050	4.912
24	4.657	4.907	4.599	4.590	4.690	4.823	4.819
25	5.694	5.347	5.617	5.493	5.204	5.505	5.416
26	4.644	4.654	4.673	4.564	4.575	4.654	4.543
27	4.625	4.812	4.710	4.771	4.564	4.745	4.663
28	5.165	5.153	5.124	5.043	4.990	5.056	4.984
29	5.166	5.474	5.087	5.047	5.295	5.063	5.241
30	4.994	5.372	4.916	4.908	5.148	4.913	5.070
31	5.220	5.572	5.263	5.204	5.389	5.407	5.308
32	4.736	5.009	4.760	4.685	4.789	4.946	4.933
33	4.595	4.700	4.605	4.500	4.564	4.554	4.443
34	4.682	4.812	4.466	4.419	4.700	4.575	4.511
35	4.718	4.533	4.477	4.673	4.554	4.682	4.787
36	4.585	4.700	4.564	4.407	4.533	4.615	4.595
37	4.543	4.745	4.635	4.700	4.477	4.673	4.585
38	5.056	5.697	5.075	5.106	5.680	5.425	5.226
39	5.242	5.587	5.283	5.226	5.407	5.425	5.328
40	5.130	5.252	5.159	5.106	5.308	5.434	5.263

Subject	3_2_1	3_2_2	3_2_3	3_2_4	3_2_5	3_2_6	3_2_7
1	4.407	4.575	4.585	4.443	4.431	4.564	4.317
2	5.024	5.130	5.338	5.037	5.069	5.303	4.913
3	5.209	5.308	5.493	5.231	5.252	5.389	5.182
4	4.489	4.431	4.564	4.564	4.554	4.635	4.407
5	5.147	5.308	5.613	5.193	5.283	5.513	4.927
6	5.489	5.333	5.565	5.645	5.656	5.652	5.352
7	4.331	4.394	4.533	4.522	4.625	4.477	4.394
8	5.305	5.409	5.752	5.369	5.328	5.725	5.248
9	5.236	5.412	5.733	5.283	5.421	5.677	5.037
10	5.746	5.989	6.303	5.717	5.832	6.301	5.591
11	4.635	4.779	4.828	4.682	4.615	4.625	4.533
12	4.443	4.543	4.605	4.443	4.466	4.489	4.357
13	4.554	4.663	4.754	4.543	4.615	4.663	4.500
14	4.754	4.913	5.170	4.779	4.860	5.100	4.585
15	4.443	4.605	4.615	4.477	4.466	4.595	4.357
16	4.369	4.543	4.554	4.407	4.394	4.533	4.277
17	5.147	5.252	5.447	5.170	5.193	5.338	5.118
18	5.170	5.273	5.464	5.193	5.215	5.357	5.142
19	4.234	4.304	4.454	4.443	4.554	4.394	4.304
20	4.466	4.522	4.644	4.635	4.727	4.595	4.522
21	4.344	4.500	4.533	4.407	4.454	4.511	4.190
22	4.553	4.710	4.931	4.757	4.653	4.846	4.771
23	4.605	4.539	4.600	4.792	4.498	4.503	4.748
24	4.407	4.426	4.674	4.485	4.349	4.562	4.314
25	4.710	5.017	5.226	4.710	4.875	5.165	4.605
26	4.263	4.454	4.466	4.304	4.290	4.443	4.159
27	5.501	5.537	5.591	5.624	5.680	5.595	5.670
28	4.852	4.963	5.112	4.913	4.956	5.024	4.956
29	4.920	5.099	5.118	4.932	5.006	4.930	4.723
30	4.974	5.099	5.175	5.006	5.119	5.127	4.877
31	5.775	5.849	6.131	5.858	5.852	5.808	5.743
32	4.497	4.461	4.764	4.560	4.486	4.640	4.436
33	4.477	4.554	4.575	4.533	4.419	4.554	4.407
34	4.585	4.663	4.787	4.585	4.511	4.787	4.605
35	4.595	4.812	4.990	4.595	4.673	5.043	4.522
36	4.394	4.625	4.852	4.466	4.500	4.787	4.511
37	5.468	5.505	5.561	5.595	5.652	5.565	5.642
38	5.318	5.572	5.753	5.371	5.472	5.384	5.231
39	5.787	5.861	6.140	5.869	5.864	5.820	5.756
40	5.318	5.447	5.642	5.371	5.407	5.394	5.298

Subject	3_2_8	3_2_9	3_3_1	3_3_2	3_3_3	3_3_4	3_3_5
1	4.727	4.615	4.290	4.357	4.382	4.290	4.234
2	5.024	5.182	4.511	4.564	4.585	4.489	4.382
3	5.384	5.505	5.100	5.247	5.257	5.112	5.242
4	4.466	4.644	4.331	4.304	4.466	4.331	4.205
5	5.124	5.380	4.290	4.344	4.554	4.357	4.234
6	5.694	5.694	5.124	5.318	5.298	5.075	5.242
7	4.454	4.554	4.234	4.234	4.263	4.190	4.344
8	5.587	5.875	4.822	4.945	4.894	4.828	4.737
9	5.283	5.481	4.290	4.357	4.554	4.317	4.331
10	5.919	6.317	5.236	5.318	5.416	5.215	5.204
11	4.407	4.605	4.860	4.875	4.812	4.942	5.226
12	4.407	4.344	4.369	4.500	4.564	4.344	4.317
13	4.595	4.595	4.431	4.522	4.564	4.369	4.357
14	4.736	4.942	4.466	4.466	4.489	4.489	4.431
15	4.754	4.644	4.331	4.394	4.419	4.331	4.277
16	4.700	4.585	4.248	4.317	4.344	4.248	4.190
17	5.333	5.460	5.030	5.187	5.198	5.043	5.182
18	5.352	5.476	5.056	5.209	5.220	5.069	5.204
19	4.369	4.477	4.127	4.127	4.159	4.078	4.248
20	4.575	4.663	4.382	4.382	4.407	4.344	4.477
21	4.290	4.407	4.382	4.511	4.369	4.304	4.205
22	4.628	4.463	4.060	4.108	4.114	3.933	3.864
23	5.002	4.754	4.325	4.454	4.385	4.212	4.223
24	4.588	4.754	4.060	4.159	4.446	3.985	4.010
25	4.836	5.063	4.431	4.575	4.654	4.431	4.477
26	4.625	4.500	4.127	4.205	4.234	4.127	4.060
27	5.869	5.858	4.595	4.595	4.644	4.575	4.431
28	5.142	5.209	4.852	4.860	4.820	4.804	4.860
29	4.943	4.861	4.371	4.470	4.660	4.527	4.359
30	5.061	4.968	4.445	4.482	4.731	4.565	4.318
31	5.771	5.969	4.828	5.030	5.226	4.796	4.905
32	4.706	4.865	4.037	4.159	4.423	3.998	3.973
33	4.369	4.644	4.522	4.635	4.419	4.331	4.094
34	4.673	4.927	4.836	4.868	4.787	4.500	4.407
35	4.663	4.942	4.920	5.136	4.820	4.682	4.543
36	4.736	4.977	4.585	4.828	4.710	4.454	4.382
37	5.846	5.835	4.511	4.511	4.564	4.489	4.331
38	5.455	5.717	4.443	4.844	4.990	4.466	4.564
39	5.784	5.979	4.860	5.056	5.247	4.828	4.934
40	5.525	5.659	4.727	4.779	4.905	4.654	4.575

Subject	3_3_6	3_3_7	3_3_8	3_3_9	4_1_1	4_1_2	4_1_3
1	4.248	4.025	4.174	4.174	4.920	4.949	4.868
2	4.489	4.394	4.431	4.477	4.852	4.875	4.963
3	5.209	4.977	5.142	5.112	5.088	5.170	5.159
4	4.304	4.174	4.159	4.277	5.118	4.883	4.977
5	4.394	4.111	4.190	4.419	4.635	4.605	4.644
6	5.257	4.836	5.094	5.215	5.220	5.342	5.602
7	4.304	4.190	4.277	4.419	4.673	4.754	4.890
8	4.636	4.773	4.741	4.802	5.231	5.229	5.297
9	4.466	4.190	4.263	4.522	4.564	4.511	4.554
10	5.375	4.898	5.050	5.308	5.273	5.165	5.069
11	4.585	4.654	4.718	4.511	4.454	4.277	4.317
12	4.382	4.304	4.290	4.205	4.820	4.905	4.984
13	4.394	4.220	4.220	4.220	4.736	4.771	4.745
14	4.443	4.331	4.382	4.431	4.736	4.828	4.898
15	4.290	4.078	4.220	4.220	4.942	4.970	4.890
16	4.205	3.970	4.127	4.127	4.898	4.927	4.844
17	5.147	4.898	5.075	5.043	5.017	5.106	5.094
18	5.170	4.927	5.100	5.069	5.043	5.130	5.118
19	4.205	4.078	4.174	4.331	4.605	4.691	4.836
20	4.443	4.344	4.419	4.543	4.771	4.844	4.970
21	4.263	4.190	4.419	4.394	4.745	4.663	4.754
22	3.872	3.898	3.894	3.981	4.976	5.028	5.024
23	4.057	4.263	4.381	4.208	5.116	5.056	5.033
24	4.117	4.046	4.136	4.344	4.903	4.753	4.801
25	4.554	4.234	4.382	4.533	5.481	5.318	5.595
26	4.078	3.807	3.989	3.989	4.836	4.868	4.779
27	4.477	4.357	4.511	4.635	5.389	5.094	5.004
28	4.771	4.718	4.852	4.828	5.069	5.142	5.193
29	4.328	4.388	4.475	4.433	5.501	5.339	5.310
30	4.422	4.388	4.393	4.447	5.378	5.160	5.138
31	4.934	4.369	4.625	4.812	5.198	5.159	5.231
32	4.104	4.104	4.184	4.467	4.980	4.808	4.862
33	4.220	4.344	4.357	4.369	4.635	4.533	4.585
34	4.673	4.466	4.654	4.654	4.718	4.615	4.605
35	4.710	4.454	4.585	4.615	4.419	4.419	4.500
36	4.489	4.357	4.522	4.710	4.654	4.533	4.533
37	4.382	4.248	4.419	4.554	5.352	5.043	4.949
38	4.543	4.159	4.533	4.796	4.787	4.812	4.934
39	4.963	4.419	4.663	4.844	5.220	5.182	5.252
40	4.663	4.533	4.533	4.718	5.247	5.176	5.159

Subject	4_1_4	4_1_5	4_1_6	4_1_7	4_1_8	4_1_9	4_2_1
1	5.056	5.030	4.812	5.069	5.094	4.898	4.466
2	4.890	4.812	4.898	4.852	4.868	4.828	4.997
3	5.198	5.226	5.118	5.024	5.170	5.063	5.094
4	5.268	5.063	4.905	5.182	4.949	4.844	4.419
5	4.787	4.727	4.644	4.663	4.635	4.605	5.030
6	5.209	5.263	5.513	5.293	5.472	5.587	5.252
7	4.654	4.615	4.585	4.787	4.934	4.844	4.796
8	5.407	5.387	5.306	5.237	5.359	5.270	5.411
9	4.595	4.654	4.511	4.511	4.554	4.533	5.075
10	5.308	5.263	5.094	5.063	5.081	4.970	5.389
11	4.489	4.500	4.174	4.431	4.625	4.522	4.344
12	4.883	4.934	4.970	4.754	4.927	4.905	4.407
13	4.836	4.860	4.691	4.754	4.836	4.682	4.443
14	4.796	4.852	4.868	4.762	4.787	4.710	4.673
15	5.075	5.050	4.836	5.088	5.112	4.920	4.500
16	5.037	5.011	4.787	5.050	5.075	4.875	4.431
17	5.136	5.165	5.050	4.949	5.106	4.990	5.024
18	5.159	5.187	5.075	4.977	5.130	5.017	5.050
19	4.585	4.543	4.511	4.727	4.883	4.787	4.736
20	4.754	4.718	4.691	4.875	5.011	4.927	4.883
21	4.836	4.615	4.575	4.663	4.533	4.489	4.489
22	5.039	5.092	5.016	5.180	5.148	5.021	4.659
23	5.260	5.218	4.995	5.189	5.174	5.041	4.712
24	5.009	4.821	4.708	4.820	4.946	4.948	4.514
25	5.545	5.472	5.283	5.389	5.361	5.118	4.745
26	4.984	4.956	4.718	4.997	5.024	4.812	4.331
27	5.513	5.050	4.997	5.485	5.308	5.147	5.412
28	5.170	5.231	5.193	5.112	5.226	5.159	4.883
29	5.576	5.309	5.165	5.426	5.187	5.371	5.026
30	5.474	5.137	5.026	5.279	5.037	5.199	5.080
31	5.352	5.069	4.984	5.328	5.170	4.997	5.357
32	5.060	4.835	4.751	4.865	5.007	5.007	4.606
33	4.779	4.605	4.489	4.654	4.718	4.511	4.331
34	4.883	4.663	4.431	4.736	4.673	4.533	4.394
35	4.654	4.511	4.511	4.682	4.654	4.575	4.466
36	4.820	4.615	4.431	4.654	4.654	4.564	4.615
37	5.481	4.997	4.942	5.451	5.268	5.100	5.375
38	4.762	4.673	4.691	4.762	4.934	4.860	5.308
39	5.371	5.094	5.011	5.347	5.193	5.024	5.375
40	5.352	5.037	4.997	5.247	5.153	4.997	5.293

Subject	4_2_2	4_2_3	4_2_4	4_2_5	4_2_6	4_2_7	4_2_8
1	4.710	4.727	4.533	4.673	4.682	4.585	5.011
2	5.112	5.371	4.990	5.043	5.371	4.812	5.024
3	5.268	5.357	5.094	5.100	5.130	4.970	5.273
4	4.357	4.511	4.533	4.466	4.511	4.443	4.477
5	5.257	5.684	5.069	5.247	5.591	4.883	5.130
6	5.673	5.656	5.389	5.572	5.628	5.545	5.694
7	5.384	5.897	4.898	4.796	5.481	4.836	5.268
8	5.538	5.895	5.463	5.541	5.847	5.382	5.711
9	5.242	5.620	5.165	5.257	5.537	5.037	5.263
10	5.493	5.953	5.434	5.642	6.068	5.204	5.545
11	4.357	4.644	4.454	4.443	4.511	4.615	4.663
12	4.533	4.615	4.407	4.477	4.522	4.331	4.454
13	4.522	4.595	4.443	4.454	4.477	4.344	4.431
14	4.754	4.890	4.718	4.700	4.836	4.533	4.625
15	4.736	4.754	4.564	4.700	4.710	4.615	5.030
16	4.682	4.700	4.500	4.644	4.654	4.554	4.990
17	5.209	5.303	5.024	5.030	5.063	4.890	5.215
18	5.231	5.323	5.050	5.056	5.088	4.920	5.236
19	5.352	5.878	4.844	4.736	5.451	4.779	5.231
20	5.434	5.927	4.977	4.883	5.525	4.920	5.323
21	4.477	4.585	4.554	4.466	4.635	4.543	4.605
22	4.839	5.074	4.851	4.866	4.968	4.905	4.752
23	4.668	4.743	4.886	4.711	4.625	4.882	5.126
24	4.555	4.817	4.579	4.562	4.684	4.448	4.712
25	4.934	5.153	4.796	4.913	5.069	4.615	4.787
26	4.605	4.625	4.407	4.564	4.575	4.466	4.934
27	5.595	5.820	5.472	5.617	5.380	5.549	5.778
28	4.990	5.209	4.868	4.977	5.100	4.883	5.112
29	5.228	5.261	5.026	5.219	5.053	4.857	5.067
30	5.228	5.318	5.100	5.332	5.249	5.011	5.185
31	5.509	5.781	5.468	5.545	5.521	5.447	5.572
32	4.590	4.851	4.634	4.587	4.699	4.507	4.775
33	4.522	4.522	4.331	4.331	4.489	4.174	4.331
34	4.511	4.605	4.431	4.443	4.466	4.220	4.382
35	4.635	4.745	4.500	4.585	4.663	4.304	4.511
36	4.691	4.860	4.700	4.635	4.754	4.522	4.595
37	5.565	5.796	5.438	5.587	5.342	5.517	5.753
38	5.557	5.905	5.361	5.521	5.403	5.283	5.557
39	5.525	5.793	5.485	5.561	5.537	5.464	5.587
40	5.505	5.802	5.352	5.460	5.403	5.263	5.485

Subject	4_2_9	4_3_1	4_3_2	4_3_3	4_3_4	4_3_5	4_3_6
1	4.828	4.277	4.394	4.394	4.263	4.190	4.205
2	5.303	4.654	4.654	4.673	4.644	4.543	4.575
3	5.347	4.852	4.913	4.868	4.890	4.949	4.836
4	4.644	4.454	4.357	4.431	4.489	4.304	4.331
5	5.375	4.304	4.357	4.564	4.357	4.304	4.443
6	5.455	4.927	5.112	5.303	5.081	5.063	5.165
7	5.576	4.949	5.153	5.075	4.913	5.075	5.106
8	6.009	4.811	4.924	4.894	4.803	4.699	4.623
9	5.451	4.277	4.344	4.585	4.331	4.304	4.443
10	5.935	4.990	5.024	5.043	4.970	4.905	5.037
11	4.771	4.431	4.317	4.543	4.489	4.248	4.344
12	4.477	4.369	4.489	4.543	4.344	4.357	4.407
13	4.394	4.317	4.419	4.454	4.263	4.248	4.277
14	4.779	4.331	4.522	4.419	4.290	4.290	4.317
15	4.852	4.317	4.431	4.431	4.304	4.234	4.248
16	4.804	4.234	4.357	4.357	4.220	4.143	4.159
17	5.293	4.762	4.828	4.779	4.804	4.868	4.745
18	5.313	4.796	4.860	4.812	4.836	4.898	4.779
19	5.549	4.898	5.112	5.030	4.860	5.030	5.063
20	5.617	5.024	5.215	5.142	4.990	5.142	5.170
21	4.852	4.263	4.248	4.357	4.234	4.174	4.263
22	4.596	4.049	4.086	4.114	3.908	3.827	3.859
23	4.887	4.314	4.432	4.385	4.187	4.186	4.044
24	4.887	4.049	4.137	4.446	3.960	3.973	4.104
25	4.997	4.394	4.500	4.635	4.394	4.454	4.564
26	4.736	4.111	4.248	4.248	4.094	4.007	4.025
27	5.838	4.682	4.890	5.037	4.554	4.595	4.663
28	5.165	4.860	4.898	4.828	4.828	4.890	4.762
29	4.994	4.360	4.448	4.660	4.502	4.321	4.315
30	5.102	4.434	4.460	4.731	4.539	4.281	4.409
31	5.700	4.466	4.644	4.762	4.443	4.443	4.454
32	4.919	3.979	4.006	4.411	3.947	3.934	4.050
33	4.511	4.407	4.443	4.394	4.331	4.248	4.317
34	4.500	4.511	4.615	4.511	4.443	4.263	4.304
35	4.654	4.511	4.682	4.625	4.511	4.394	4.477
36	4.820	4.290	4.419	4.533	4.331	4.159	4.331
37	5.814	4.605	4.828	4.984	4.466	4.511	4.585
38	5.768	4.454	4.745	5.130	4.407	4.489	4.543
39	5.714	4.511	4.682	4.796	4.489	4.489	4.500
40	5.684	4.543	4.673	4.745	4.489	4.466	4.500

Subject	4_3_7	4_3_8	4_3_9
1	4.111	4.277	4.234
2	4.522	4.533	4.595
3	4.700	4.779	4.771
4	4.357	4.220	4.357
5	4.078	4.127	4.331
6	4.970	5.100	5.182
7	4.511	4.990	5.069
8	4.750	4.741	4.766
9	4.143	4.248	4.443
10	4.796	4.997	5.182
11	4.331	4.431	4.554
12	4.143	4.159	4.159
13	4.094	4.127	4.143
14	4.234	4.248	4.277
15	4.159	4.317	4.277
16	4.060	4.234	4.190
17	4.595	4.682	4.673
18	4.635	4.718	4.710
19	4.431	4.942	5.024
20	4.625	5.063	5.136
21	4.043	4.060	4.277
22	3.874	3.894	3.945
23	4.239	4.381	4.172
24	4.023	4.136	4.307
25	4.234	4.369	4.533
26	3.912	4.111	4.060
27	4.522	4.673	4.796
28	4.682	4.820	4.820
29	4.364	4.475	4.397
30	4.364	4.393	4.410
31	4.394	4.575	4.644
32	3.973	4.184	4.243
33	4.248	4.585	4.466
34	4.159	4.394	4.431
35	4.248	4.304	4.489
36	4.220	4.290	4.477
37	4.431	4.595	4.727
38	4.205	4.605	4.920
39	4.443	4.615	4.682
40	4.407	4.644	4.710

Raw Data from Eyes-Open Baseline.

Subject	1_1_1	1_1_2	1_1_3	1_1_4	1_1_5	1_1_6	1_1_7
1	4.812	4.844	4.787	4.836	4.836	4.691	4.700
2	4.762	4.736	4.691	4.804	4.736	4.635	4.635
3	4.836	4.868	4.883	4.905	4.868	4.812	4.812
4	5.118	4.890	4.860	5.187	4.942	4.771	5.011
5	4.419	4.419	4.369	4.511	4.489	4.394	4.419
6	5.412	5.407	5.451	5.501	5.421	5.493	5.438
7	4.635	4.682	4.615	4.710	4.762	4.564	4.443
8	4.964	4.987	5.032	5.088	5.053	4.980	4.941
9	4.500	4.466	4.419	4.554	4.511	4.431	4.489
10	5.220	5.347	5.505	5.231	5.347	5.549	5.375
11	4.804	4.691	4.585	4.796	4.700	4.511	4.860
12	4.635	4.673	4.615	4.691	4.736	4.533	4.511
13	4.682	4.673	4.654	4.673	4.635	4.511	4.554
14	4.942	4.942	5.011	4.956	4.905	4.990	4.852
15	4.836	4.868	4.812	4.860	4.860	4.718	4.727
16	4.787	4.820	4.762	4.812	4.812	4.663	4.673
17	4.745	4.779	4.796	4.820	4.779	4.718	4.718
18	4.779	4.812	4.828	4.852	4.812	4.754	4.754
19	4.564	4.615	4.543	4.644	4.700	4.489	4.357
20	4.736	4.779	4.718	4.804	4.852	4.673	4.564
21	4.263	4.419	4.533	4.317	4.431	4.454	4.554
22	4.357	4.533	4.654	4.407	4.382	4.466	4.595
23	4.304	4.489	4.663	4.331	4.443	4.533	4.533
24	4.304	4.382	4.543	4.317	4.304	4.331	4.443
25	4.682	4.771	4.868	4.745	4.771	4.860	4.700
26	4.718	4.754	4.691	4.745	4.745	4.585	4.595
27	4.844	4.754	4.771	4.852	4.700	4.575	4.844
28	5.004	4.920	4.860	5.075	4.942	4.762	4.934
29	5.234	5.098	5.044	5.257	4.975	4.838	5.129
30	5.112	4.918	4.872	5.154	4.803	4.699	4.982
31	5.624	5.043	5.024	5.236	4.956	4.898	5.215
32	4.637	4.511	4.535	4.689	4.486	4.381	4.523
33	4.234	4.394	4.511	4.290	4.466	4.564	4.522
34	4.111	4.302	4.536	4.302	4.111	4.220	4.407
35	4.382	4.466	4.691	4.248	4.407	4.511	4.419
36	4.157	4.558	4.624	4.377	4.143	4.252	4.625
37	4.779	4.682	4.700	4.787	4.625	4.489	4.779
38	5.081	4.956	4.868	4.942	4.762	4.644	4.700
39	5.638	5.069	5.050	5.257	4.984	4.927	5.236
40	5.298	5.063	5.017	5.081	4.949	4.796	5.056

* Column Headings: A_B_C: A(time): 1=time 1, 2=time2, 3=time3, 4=time4; B(band): 1=theta, 2=alpha, 3=beta; C(location): 1=F3, 2=C3, 3=P3, 4=FZ, 5=CZ , 6=PZ, 7=F4, 8=C4, 9=P4.

Subject	1_1_8	1_1_9	1_2_1	1_2_2	1_2_3	1_2_4	1_2_5
1	4.745	4.615	4.407	4.543	4.554	4.431	4.443
2	4.673	4.533	4.564	4.635	4.700	4.605	4.654
3	4.875	4.779	4.977	5.252	5.442	4.990	5.056
4	4.820	4.718	4.595	4.443	4.533	4.635	4.554
5	4.431	4.357	4.585	4.771	5.030	4.654	4.682
6	5.407	5.380	5.403	5.598	5.505	5.485	5.642
7	4.511	4.500	4.431	4.394	4.762	4.543	4.796
8	5.060	4.949	5.161	5.292	5.626	5.148	5.210
9	4.431	4.317	4.511	4.673	4.804	4.554	4.543
10	5.357	5.425	5.153	5.357	5.576	5.170	5.303
11	4.700	4.533	4.248	4.454	4.654	4.111	4.263
12	4.533	4.344	4.382	4.454	4.511	4.382	4.369
13	4.605	4.443	4.277	4.331	4.443	4.290	4.248
14	4.934	4.905	4.927	5.063	5.485	4.977	5.069
15	4.771	4.644	4.443	4.575	4.585	4.466	4.477
16	4.718	4.585	4.369	4.511	4.522	4.394	4.407
17	4.787	4.682	4.898	5.193	5.394	4.913	4.984
18	4.820	4.718	4.927	5.215	5.412	4.942	5.011
19	4.431	4.419	4.344	4.304	4.700	4.466	4.736
20	4.625	4.615	4.554	4.522	4.852	4.654	4.883
21	4.654	4.595	4.248	4.575	4.673	4.331	4.431
22	4.543	4.394	4.174	4.263	4.394	4.190	4.248
23	4.644	4.615	4.159	4.575	4.710	4.174	4.357
24	4.595	4.554	4.159	4.500	4.691	4.220	4.290
25	4.812	4.828	4.190	4.477	4.796	4.220	4.443
26	4.644	4.500	4.263	4.419	4.431	4.290	4.304
27	4.963	4.673	5.043	5.170	5.434	5.069	5.094
28	4.963	4.836	5.193	5.357	5.529	5.215	5.215
29	4.888	5.049	4.775	4.982	4.992	4.711	4.889
30	4.738	4.878	4.830	4.982	5.049	4.785	5.001
31	5.182	5.118	5.159	5.176	5.263	5.242	5.236
32	4.648	4.626	4.263	4.309	4.547	4.263	4.231
33	4.673	4.595	4.290	4.644	4.615	4.304	4.443
34	4.431	4.143	4.289	4.242	4.450	4.098	4.065
35	4.682	4.595	4.127	4.554	4.673	4.127	4.419
36	4.399	4.431	4.334	4.695	4.841	4.471	4.104
37	4.905	4.595	4.990	5.124	5.398	5.017	5.043
38	4.927	4.934	4.828	5.024	5.357	4.804	4.875
39	5.204	5.142	5.182	5.198	5.283	5.263	5.257
40	5.209	5.159	5.170	5.030	5.380	5.069	4.984

Subject	1_2_6	1_2_7	1_2_8	1_2_9	1_3_1	1_3_2	1_3_3
1	4.443	4.263	4.489	4.394	4.263	4.357	4.304
2	4.736	4.533	4.700	4.605	4.454	4.477	4.489
3	5.352	4.898	5.298	5.438	4.575	4.718	4.771
4	4.554	4.407	4.394	4.771	4.304	4.263	4.382
5	4.949	4.543	4.691	4.905	4.174	4.190	4.174
6	5.587	5.268	5.464	5.313	4.860	4.927	5.050
7	4.860	4.533	4.970	4.890	4.394	4.454	4.625
8	5.516	5.081	5.408	5.692	4.892	5.002	4.995
9	4.779	4.394	4.511	4.710	4.111	4.190	4.174
10	5.670	4.970	5.159	5.429	4.585	4.682	4.844
11	4.564	4.094	4.489	4.489	4.477	4.489	4.644
12	4.382	4.277	4.277	4.190	4.344	4.419	4.477
13	4.317	4.248	4.344	4.317	4.317	4.394	4.522
14	5.472	4.875	5.100	5.398	4.394	4.419	4.489
15	4.477	4.304	4.522	4.431	4.304	4.394	4.344
16	4.407	4.220	4.454	4.357	4.220	4.317	4.263
17	5.298	4.812	5.242	5.389	4.454	4.615	4.673
18	5.318	4.844	5.263	5.407	4.500	4.654	4.710
19	4.804	4.454	4.920	4.836	4.304	4.369	4.554
20	4.942	4.644	5.043	4.970	4.522	4.575	4.727
21	4.605	4.477	4.718	4.500	4.094	4.277	4.443
22	4.394	4.205	4.317	4.407	4.190	4.277	4.419
23	4.554	4.585	4.828	4.625	4.127	4.431	4.605
24	4.554	4.644	4.963	4.736	4.205	4.369	4.511
25	4.762	4.159	4.431	4.575	4.174	4.277	4.443
26	4.304	4.094	4.357	4.248	4.094	4.205	4.143
27	5.263	4.836	5.142	5.263	4.787	4.787	4.804
28	5.442	5.136	5.407	5.565	4.644	4.762	4.828
29	4.721	4.556	4.764	4.677	4.441	4.527	4.761
30	4.918	4.711	4.882	4.785	4.515	4.539	4.833
31	5.231	5.094	5.170	5.283	4.554	4.466	4.489
32	4.353	4.147	4.408	4.570	4.130	4.215	4.547
33	4.500	4.454	4.727	4.419	4.025	4.220	4.407
34	4.585	4.025	4.353	4.190	4.426	4.510	4.629
35	4.522	4.682	4.852	4.635	4.094	4.407	4.585
36	4.720	4.791	5.041	4.804	4.323	4.127	4.275
37	5.220	4.771	5.094	5.220	4.718	4.718	4.736
38	5.165	4.812	5.017	5.187	4.522	4.663	4.682
39	5.252	5.118	5.193	5.303	4.595	4.511	4.533
40	5.193	5.081	5.273	5.394	4.691	4.682	4.779

Subject	1_3_4	1_3_5	1_3_6	1_3_7	1_3_8	1_3_9	2_1_1
1	4.263	4.234	4.159	4.111	4.234	4.174	4.970
2	4.419	4.317	4.382	4.248	4.277	4.317	4.663
3	4.554	4.564	4.605	4.454	4.615	4.700	5.043
4	4.290	4.248	4.290	4.060	4.043	4.331	5.069
5	4.174	4.111	4.174	4.078	4.043	4.159	4.511
6	4.828	4.890	4.970	4.625	4.710	4.828	5.670
7	4.431	4.443	4.407	4.543	4.673	4.564	4.787
8	5.024	4.908	4.858	4.892	4.883	4.933	5.155
9	4.127	4.094	4.205	4.043	4.007	4.078	4.394
10	4.564	4.554	4.796	4.543	4.575	4.682	5.318
11	4.500	4.625	4.644	4.407	4.575	4.564	4.543
12	4.331	4.304	4.331	4.111	4.078	4.094	4.718
13	4.277	4.263	4.344	4.043	4.094	4.159	4.644
14	4.369	4.317	4.407	4.174	4.248	4.317	4.860
15	4.304	4.277	4.205	4.159	4.277	4.220	4.990
16	4.220	4.190	4.111	4.060	4.190	4.196	4.949
17	4.431	4.443	4.489	4.317	4.500	4.595	4.970
18	4.477	4.489	4.533	4.369	4.543	4.635	4.997
19	4.344	4.357	4.317	4.466	4.605	4.489	4.727
20	4.554	4.564	4.533	4.654	4.771	4.673	4.875
21	4.078	4.094	4.248	4.190	4.263	4.234	4.220
22	4.143	4.174	4.277	4.234	4.220	4.234	4.007
23	4.060	4.304	4.466	4.407	4.317	4.331	4.394
24	4.127	4.159	4.290	4.094	4.220	4.357	4.220
25	4.174	4.190	4.174	4.094	4.159	4.111	4.585
26	4.094	4.060	3.970	3.912	4.060	3.989	4.890
27	4.644	4.585	4.654	4.585	4.836	4.745	5.118
28	4.635	4.635	4.663	4.489	4.654	4.736	4.963
29	4.723	4.530	4.549	4.506	4.617	4.563	5.425
30	4.761	4.490	4.643	4.506	4.535	4.577	5.302
31	4.304	4.190	4.248	4.263	4.357	4.331	5.081
32	4.182	4.182	4.338	4.165	4.279	4.474	4.868
33	4.025	4.143	4.382	4.205	4.205	4.277	4.304
34	4.384	4.393	4.482	4.344	4.315	3.932	3.738
35	4.007	4.277	4.500	4.382	4.277	4.357	4.220
36	3.871	4.023	3.989	3.767	3.932	4.220	4.112
37	4.564	4.500	4.575	4.500	4.771	4.673	5.069
38	4.419	4.382	4.407	4.263	4.511	4.489	5.118
39	4.357	4.248	4.304	4.317	4.407	4.382	5.106
40	4.543	4.489	4.644	4.407	4.635	4.710	5.357

Subject	2_1_2	2_1_3	2_1_4	2_1_5	2_1_6	2_1_7	2_1_8
1	5.043	5.011	5.011	5.004	4.927	4.828	4.934
2	4.575	4.477	4.691	4.533	4.443	4.511	4.489
3	4.990	4.970	5.106	5.004	4.942	4.963	5.017
4	4.875	4.820	5.153	4.984	4.796	5.063	4.913
5	4.466	4.431	4.564	4.543	4.431	4.369	4.419
6	5.638	5.635	5.398	5.460	5.541	5.425	5.631
7	4.883	4.836	4.700	4.820	4.635	4.663	4.736
8	5.161	5.127	5.358	5.308	5.242	5.164	5.275
9	4.382	4.304	4.477	4.489	4.317	4.454	4.489
10	5.505	5.568	5.298	5.451	5.545	5.533	5.598
11	4.605	4.691	4.605	4.700	4.595	4.736	4.779
12	4.736	4.700	4.812	4.828	4.635	4.625	4.605
13	4.710	4.673	4.700	4.754	4.595	4.605	4.615
14	4.875	4.942	4.898	4.836	4.942	4.787	4.812
15	5.063	5.030	5.030	5.024	4.949	4.852	4.956
16	5.024	4.990	4.990	4.984	4.905	4.804	4.913
17	4.913	4.890	5.037	4.927	4.860	4.883	4.942
18	4.942	4.920	5.063	4.956	4.890	4.913	4.970
19	4.828	4.779	4.635	4.762	4.564	4.595	4.673
20	4.963	4.920	4.796	4.905	4.736	4.762	4.828
21	4.357	4.615	4.317	4.407	4.543	4.727	4.779
22	4.190	4.369	4.043	4.190	4.290	4.248	4.205
23	4.466	4.644	4.407	4.382	4.454	4.489	4.511
24	4.317	4.466	4.263	4.277	4.357	4.575	4.673
25	4.771	4.787	4.595	4.663	4.663	4.477	4.644
26	4.970	4.934	4.934	4.927	4.844	4.736	4.852
27	5.004	5.017	5.037	4.898	4.913	4.820	4.771
28	4.905	4.905	5.043	4.927	4.836	5.004	4.990
29	5.271	5.139	5.527	5.229	5.100	5.352	5.103
30	5.092	4.968	5.424	5.057	4.962	5.205	4.953
31	4.890	4.984	4.963	4.905	4.942	5.050	5.063
32	4.726	4.774	4.997	4.779	4.681	4.801	4.910
33	4.394	4.595	4.317	4.454	4.615	4.654	4.745
34	3.850	4.174	3.738	3.970	4.060	4.007	3.970
35	4.317	4.500	4.290	4.477	4.248	4.290	4.511
36	4.060	4.263	4.212	3.970	4.143	4.751	4.582
37	4.949	4.963	4.984	4.836	4.852	4.754	4.700
38	4.796	4.615	5.100	4.575	4.344	4.663	4.554
39	4.920	5.011	4.990	4.934	4.970	5.075	5.088
40	5.147	4.920	5.293	5.011	4.710	4.956	4.852

Subject	2_1_9	2_2_1	2_2_2	2_2_3	2_2_4	2_2_5	2_2_6
1	4.820	4.615	4.804	4.727	4.663	4.585	4.595
2	4.369	4.443	4.407	4.511	4.466	4.357	4.477
3	4.956	5.147	5.342	5.529	5.136	5.176	5.421
4	4.812	4.615	4.625	4.700	4.718	4.727	4.700
5	4.382	4.454	4.625	4.920	4.511	4.595	4.963
6	5.545	5.680	5.635	5.670	5.680	5.635	5.645
7	4.644	4.369	4.533	4.868	4.290	4.443	4.682
8	5.180	5.351	5.466	5.808	5.418	5.457	5.782
9	4.394	4.317	4.454	4.691	4.369	4.407	4.654
10	5.549	5.472	5.717	5.866	5.489	5.565	5.784
11	4.718	4.382	4.663	5.106	4.585	4.554	4.860
12	4.382	4.443	4.554	4.635	4.454	4.489	4.500
13	4.443	4.344	4.454	4.543	4.344	4.369	4.419
14	4.868	4.554	4.615	4.745	4.585	4.543	4.700
15	4.844	4.644	4.828	4.754	4.691	4.615	4.625
16	4.796	4.585	4.779	4.700	4.635	4.554	4.564
17	4.875	5.081	5.288	5.485	5.069	5.112	5.371
18	4.905	5.106	5.308	5.501	5.094	5.136	5.389
19	4.575	4.277	4.454	4.812	4.190	4.357	4.615
20	4.745	4.500	4.644	4.949	4.431	4.564	4.779
21	4.635	4.111	4.431	4.543	4.127	4.159	4.489
22	4.205	4.220	4.663	4.779	4.190	4.331	4.682
23	4.331	4.111	4.263	4.477	4.078	4.159	4.357
24	4.554	4.431	4.682	4.771	4.394	4.369	4.585
25	4.682	4.466	4.828	4.977	4.454	4.673	4.970
26	4.727	4.500	4.710	4.625	4.554	4.466	4.477
27	4.920	4.990	5.170	5.485	5.056	5.056	5.303
28	4.883	5.187	5.389	5.468	5.215	5.182	5.273
29	5.280	4.966	5.156	5.174	4.981	5.135	4.988
30	5.109	5.021	5.156	5.231	5.055	5.248	5.184
31	5.136	5.142	5.112	5.263	5.024	5.024	5.136
32	4.904	4.498	4.520	4.778	4.578	4.528	4.634
33	4.554	3.850	4.190	4.443	3.829	3.951	4.290
34	3.932	3.951	4.554	4.749	3.932	4.323	4.841
35	4.344	4.007	4.220	4.407	4.007	4.159	4.205
36	4.382	4.440	4.630	4.842	4.413	3.952	4.660
37	4.860	4.934	5.124	5.451	5.004	5.004	5.263
38	4.431	4.727	4.844	4.860	4.771	4.663	4.682
39	5.159	5.165	5.136	5.283	5.050	5.050	5.159
40	4.796	5.075	5.075	5.263	5.142	5.094	5.198

Subject	2_2_7	2_2_8	2_2_9	2_3_1	2_3_2	2_3_3	2_3_4
1	4.522	4.963	4.771	4.407	4.443	4.394	4.331
2	4.317	4.489	4.407	4.159	4.094	4.127	4.143
3	5.056	5.394	5.549	4.762	4.868	4.898	4.727
4	4.595	4.585	4.796	4.454	4.477	4.635	4.443
5	4.454	4.745	5.075	4.304	4.344	4.317	4.317
6	5.493	5.313	5.565	5.004	5.094	5.165	4.977
7	4.205	4.736	4.727	4.477	4.382	4.304	4.317
8	5.304	5.627	5.927	4.808	4.940	5.177	4.826
9	4.344	4.466	4.673	4.078	4.078	4.159	4.043
10	5.288	5.537	5.730	4.844	5.056	5.209	4.875
11	4.605	4.890	5.159	4.317	4.477	4.500	4.369
12	4.220	4.317	4.277	4.263	4.419	4.543	4.248
13	4.277	4.369	4.331	4.357	4.466	4.554	4.331
14	4.394	4.500	4.635	4.205	4.234	4.277	4.220
15	4.554	4.984	4.796	4.443	4.477	4.431	4.369
16	4.489	4.942	4.745	4.369	4.407	4.357	4.290
17	4.984	5.342	5.505	4.663	4.779	4.812	4.625
18	5.011	5.361	5.521	4.700	4.812	4.844	4.663
19	4.094	4.673	4.663	4.394	4.290	4.205	4.220
20	4.357	4.828	4.820	4.595	4.511	4.443	4.454
21	4.419	4.663	4.595	4.060	4.205	4.489	4.094
22	4.615	4.868	4.533	4.060	4.205	4.431	4.025
23	4.466	4.575	4.635	4.111	4.220	4.419	4.078
24	4.522	4.736	4.511	4.205	4.369	4.564	4.190
25	4.344	4.700	4.890	4.277	4.419	4.431	4.234
26	4.394	4.883	4.673	4.263	4.304	4.248	4.174
27	4.990	5.153	5.278	4.644	4.820	4.754	4.585
28	5.118	5.371	5.464	4.736	4.812	4.883	4.718
29	4.780	4.983	4.912	4.357	4.465	4.943	4.525
30	4.934	5.101	5.020	4.432	4.477	5.015	4.563
31	4.796	4.875	5.017	4.394	4.533	4.595	4.277
32	4.448	4.705	4.851	4.024	4.143	4.537	3.959
33	4.431	4.787	4.394	3.951	4.025	4.443	3.892
34	4.454	4.940	4.369	4.201	4.380	4.449	4.153
35	4.533	4.533	4.575	4.277	4.304	4.454	3.912
36	4.304	4.628	4.590	3.871	4.190	4.344	4.012
37	4.934	5.106	5.236	4.564	4.754	4.682	4.500
38	4.673	4.762	4.745	4.635	4.883	4.804	4.585
39	4.828	4.905	5.043	4.443	4.575	4.635	4.331
40	5.263	5.416	5.513	4.736	4.585	4.511	4.595

Subject	2_3_5	2_3_6	2_3_7	2_3_8	2_3_9	3_1_1	3_1_2
1	4.277	4.234	4.127	4.248	4.159	4.700	4.787
2	3.932	4.007	3.892	3.871	3.970	4.575	4.500
3	4.727	4.762	4.727	4.804	4.913	4.984	4.927
4	4.382	4.511	4.344	4.304	4.477	4.970	4.820
5	4.248	4.304	4.111	4.094	4.174	4.431	4.419
6	4.970	5.088	4.796	4.860	4.963	5.136	5.257
7	4.357	4.344	4.357	4.382	4.443	4.615	4.605
8	4.734	4.635	4.753	4.721	4.782	5.069	5.073
9	4.025	4.143	3.912	3.989	4.111	4.454	4.489
10	4.875	5.043	4.673	4.771	4.934	5.075	5.242
11	4.419	4.407	4.025	4.443	4.575	4.605	4.595
12	4.277	4.369	4.159	4.111	4.127	4.875	4.860
13	4.357	4.419	4.094	4.143	4.205	4.718	4.745
14	4.127	4.234	4.127	4.205	4.304	4.700	4.644
15	4.317	4.277	4.174	4.290	4.205	4.727	4.812
16	4.234	4.190	4.078	4.205	4.236	4.673	4.762
17	4.625	4.663	4.625	4.710	4.828	4.905	4.844
18	4.663	4.700	4.663	4.745	4.860	4.934	4.875
19	4.263	4.248	4.263	4.290	4.357	4.543	4.533
20	4.489	4.477	4.489	4.511	4.564	4.718	4.710
21	4.111	4.344	4.304	4.304	4.304	4.205	4.382
22	4.060	4.277	4.205	4.234	4.277	4.127	4.277
23	4.078	4.205	4.220	4.220	4.290	4.331	4.543
24	4.174	4.344	4.174	4.220	4.248	4.466	4.564
25	4.331	4.290	4.043	4.060	4.248	4.710	4.844
26	4.111	4.060	3.932	4.078	3.970	4.595	4.691
27	4.564	4.543	4.511	4.736	4.644	4.836	4.718
28	4.682	4.718	4.595	4.644	4.691	4.963	4.927
29	4.356	4.326	4.367	4.455	4.413	5.339	5.184
30	4.316	4.420	4.367	4.373	4.426	5.216	5.004
31	4.317	4.477	4.477	4.443	4.500	4.796	4.787
32	3.983	4.090	4.014	4.184	4.464	4.828	4.642
33	4.007	4.419	4.220	4.290	4.304	4.094	4.466
34	4.251	3.989	4.311	4.451	3.970	3.858	4.025
35	4.078	4.263	4.394	4.094	4.234	4.477	4.595
36	3.912	4.159	3.989	3.970	4.025	4.297	4.582
37	4.477	4.454	4.419	4.663	4.564	4.771	4.644
38	4.564	4.489	4.419	4.796	4.615	4.977	4.934
39	4.369	4.522	4.522	4.489	4.543	4.828	4.820
40	4.304	4.220	4.654	4.654	4.585	5.338	5.124

Subject	3_1_3	3_1_4	3_1_5	3_1_6	3_1_7	3_1_8	3_1_9
1	4.762	4.771	4.787	4.691	4.700	4.771	4.673
2	4.500	4.654	4.489	4.454	4.575	4.575	4.500
3	4.868	5.088	4.984	4.852	5.030	5.043	4.860
4	4.883	5.050	4.934	4.898	4.942	4.860	4.844
5	4.394	4.466	4.431	4.331	4.466	4.477	4.369
6	5.371	5.231	5.429	5.497	5.242	5.303	5.318
7	4.533	4.635	4.700	4.564	4.533	4.644	4.710
8	5.127	5.279	5.139	5.162	5.080	5.191	5.097
9	4.443	4.575	4.575	4.407	4.500	4.543	4.466
10	5.447	5.159	5.352	5.576	4.875	5.024	5.257
11	4.466	4.575	4.673	4.394	4.625	4.663	4.477
12	4.754	4.949	4.942	4.718	4.745	4.754	4.511
13	4.700	4.812	4.804	4.654	4.644	4.654	4.466
14	4.654	4.736	4.673	4.663	4.710	4.754	4.691
15	4.787	4.796	4.812	4.718	4.727	4.796	4.700
16	4.736	4.745	4.762	4.663	4.673	4.745	4.644
17	4.779	5.017	4.905	4.762	4.956	4.970	4.771
18	4.812	5.043	4.934	4.796	4.984	4.997	4.804
19	4.454	4.564	4.635	4.489	4.454	4.575	4.644
20	4.644	4.736	4.796	4.673	4.644	4.745	4.804
21	4.533	4.419	4.369	4.382	4.644	4.605	4.489
22	4.431	4.220	4.317	4.344	4.443	4.466	4.357
23	4.736	4.357	4.431	4.522	4.407	4.394	4.344
24	4.700	4.489	4.466	4.533	4.407	4.575	4.500
25	5.017	4.718	4.860	4.997	4.533	4.682	4.804
26	4.663	4.673	4.691	4.585	4.595	4.673	4.564
27	4.625	4.812	4.710	4.727	4.564	4.745	4.663
28	4.898	5.030	4.927	4.796	4.920	4.934	4.796
29	5.139	5.448	5.061	5.020	5.269	5.019	5.197
30	4.968	5.345	4.889	4.882	5.122	4.869	5.026
31	4.820	4.718	4.615	4.554	4.595	4.635	4.431
32	4.709	4.982	4.733	4.659	4.762	4.902	4.889
33	4.564	4.263	4.344	4.477	4.466	4.522	4.522
34	4.248	3.945	4.111	4.190	4.234	4.277	4.190
35	4.828	4.407	4.234	4.635	4.454	4.564	4.533
36	4.728	4.255	4.533	4.313	4.314	4.431	4.277
37	4.543	4.745	4.635	4.654	4.477	4.673	4.585
38	5.011	4.934	4.956	4.890	4.898	5.142	5.187
39	4.852	4.754	4.654	4.595	4.635	4.673	4.477
40	4.942	5.242	5.024	4.796	4.913	5.094	5.037

Subject	3_2_1	3_2_2	3_2_3	3_2_4	3_2_5	3_2_6	3_2_7
1	4.431	4.595	4.605	4.466	4.454	4.585	4.344
2	4.718	4.812	4.977	4.718	4.771	5.030	4.500
3	5.081	5.293	5.361	5.069	5.088	5.198	4.898
4	4.554	4.500	4.625	4.625	4.615	4.691	4.477
5	4.382	4.489	4.700	4.419	4.431	4.727	4.344
6	5.100	5.242	5.342	5.165	5.361	5.468	5.118
7	4.875	4.970	5.278	4.920	4.804	5.050	4.673
8	5.269	5.383	5.726	5.343	5.301	5.698	5.221
9	4.700	4.836	5.136	4.754	4.762	5.112	4.615
10	5.438	5.602	5.881	5.451	5.561	5.852	5.283
11	4.394	4.127	4.263	4.443	4.431	4.111	4.290
12	4.317	4.407	4.477	4.331	4.317	4.357	4.174
13	4.304	4.407	4.522	4.331	4.344	4.419	4.205
14	4.736	4.898	5.159	4.762	4.844	5.088	4.564
15	4.466	4.625	4.635	4.500	4.489	4.615	4.382
16	4.394	4.564	4.575	4.431	4.419	4.554	4.304
17	5.011	5.236	5.308	4.997	5.017	5.136	4.812
18	5.037	5.257	5.328	5.024	5.043	5.159	4.844
19	4.820	4.920	5.242	4.868	4.745	5.004	4.605
20	4.956	5.043	5.333	4.997	4.890	5.118	4.771
21	4.369	4.615	4.654	4.369	4.407	4.710	4.477
22	3.664	4.025	4.263	3.784	3.912	4.205	4.263
23	3.611	3.970	4.248	3.611	3.664	4.078	4.220
24	3.850	4.290	4.466	3.951	4.111	4.317	4.290
25	4.394	4.477	4.673	4.419	4.431	4.654	4.263
26	4.290	4.477	4.489	4.331	4.317	4.466	4.190
27	5.501	5.537	5.591	5.624	5.680	5.537	5.670
28	5.118	5.384	5.501	5.136	5.215	5.375	5.043
29	4.884	5.073	5.092	4.905	4.979	4.904	4.696
30	4.939	5.073	5.149	4.979	5.092	5.100	4.850
31	4.754	4.754	5.278	4.820	4.754	5.075	4.796
32	4.462	4.435	4.738	4.533	4.459	4.614	4.409
33	4.500	4.663	4.691	4.500	4.369	4.745	4.644
34	3.740	3.930	3.960	3.245	3.587	4.091	3.970
35	3.714	3.892	4.407	3.714	3.850	4.111	4.174
36	3.526	4.558	4.357	3.497	3.738	4.025	3.989
37	5.468	5.505	5.561	5.595	5.652	5.505	5.642
38	4.828	4.812	5.242	4.868	4.736	5.100	4.852
39	4.787	4.787	5.298	4.852	4.787	5.100	4.828
40	5.050	5.118	5.505	5.011	5.017	5.328	4.920

Subject	3_2_8	3_2_9	3_3_1	3_3_2	3_3_3	3_3_4	3_3_5
1	4.745	4.635	4.317	4.382	4.407	4.317	4.263
2	4.771	4.898	4.466	4.615	4.357	4.357	4.248
3	5.136	5.198	4.564	4.654	4.673	4.595	4.575
4	4.533	4.700	4.407	4.382	4.533	4.407	4.290
5	4.554	4.844	4.248	4.190	4.248	4.159	4.094
6	5.303	5.328	4.595	4.644	4.852	4.615	4.615
7	4.727	5.323	4.317	4.489	4.477	4.369	4.585
8	5.543	5.831	4.786	4.919	4.867	4.801	4.710
9	4.890	5.283	4.304	4.263	4.290	4.220	4.143
10	5.613	5.855	4.754	4.890	5.017	4.745	4.779
11	4.382	4.454	4.220	4.234	4.317	4.159	4.143
12	4.220	4.174	4.248	4.382	4.511	4.234	4.248
13	4.248	4.190	4.304	4.419	4.543	4.248	4.277
14	4.718	4.927	4.443	4.443	4.466	4.466	4.407
15	4.771	4.663	4.357	4.419	4.443	4.357	4.304
16	4.718	4.605	4.277	4.344	4.369	4.277	4.220
17	5.069	5.136	4.443	4.543	4.564	4.477	4.454
18	5.094	5.159	4.489	4.585	4.605	4.522	4.500
19	4.663	5.288	4.220	4.407	4.394	4.277	4.511
20	4.820	5.375	4.454	4.605	4.595	4.500	4.691
21	4.754	4.771	4.190	4.344	4.511	4.174	4.205
22	4.344	4.382	4.094	4.344	4.489	4.060	4.127
23	4.369	4.431	3.932	4.111	4.277	3.829	3.871
24	4.595	4.511	3.989	4.304	4.522	3.912	3.989
25	4.277	4.477	4.159	4.248	4.344	4.159	4.234
26	4.644	4.522	4.159	4.234	4.263	4.159	4.094
27	5.869	5.858	4.595	4.595	4.644	4.575	4.431
28	5.333	5.394	4.691	4.812	4.812	4.700	4.718
29	4.899	4.817	4.336	4.443	4.633	4.500	4.332
30	5.017	4.924	4.410	4.455	4.705	4.538	4.292
31	5.069	5.106	4.382	4.419	4.533	4.344	4.290
32	4.662	4.821	4.002	4.132	4.396	3.971	3.946
33	4.804	4.942	4.357	4.489	4.554	4.205	4.094
34	4.403	4.234	3.932	4.060	4.248	3.664	3.871
35	4.522	4.554	3.989	3.989	4.369	3.497	3.584
36	4.727	4.290	4.035	4.083	4.331	4.096	3.629
37	5.846	5.835	4.511	4.511	4.564	4.489	4.331
38	5.024	5.273	4.369	4.382	4.533	4.220	4.190
39	5.094	5.130	4.431	4.466	4.575	4.394	4.344
40	5.106	5.380	4.357	4.431	4.691	4.344	4.331

Subject	3_3_6	3_3_7	3_3_8	3_3_9	4_1_1	4_1_2	4_1_3
1	4.277	4.060	4.205	4.205	4.934	4.963	4.883
2	4.331	4.174	4.205	4.220	4.745	4.625	4.543
3	4.522	4.454	4.615	4.625	5.118	5.118	5.094
4	4.382	4.263	4.248	4.357	5.142	4.913	5.004
5	4.234	4.043	4.025	4.159	4.663	4.533	4.500
6	4.787	4.615	4.543	4.682	5.165	5.303	5.416
7	4.511	4.248	4.419	4.431	4.898	4.779	4.691
8	4.609	4.729	4.697	4.758	5.195	5.202	5.271
9	4.263	4.094	4.143	4.317	4.419	4.419	4.394
10	4.875	4.357	4.500	4.625	5.476	5.572	5.710
11	4.007	4.331	4.263	4.205	4.615	4.605	4.625
12	4.344	4.078	4.060	4.078	4.745	4.745	4.654
13	4.382	4.043	4.043	4.094	4.654	4.691	4.625
14	4.419	4.304	4.357	4.407	4.691	4.787	4.860
15	4.317	4.111	4.248	4.248	4.956	4.984	4.905
16	4.234	4.007	4.159	4.255	4.913	4.942	4.860
17	4.394	4.317	4.500	4.511	5.050	5.050	5.024
18	4.443	4.369	4.543	4.554	5.075	5.075	5.050
19	4.431	4.143	4.331	4.344	4.844	4.718	4.625
20	4.625	4.394	4.543	4.554	4.977	4.868	4.787
21	4.357	4.111	4.127	4.190	4.205	4.369	4.564
22	4.331	4.159	4.277	4.263	4.248	4.382	4.585
23	4.043	4.007	4.190	4.290	4.357	4.511	4.654
24	4.220	4.248	4.419	4.369	4.317	4.522	4.718
25	4.263	3.970	4.078	4.190	5.118	5.193	5.288
26	4.111	3.850	4.025	4.025	4.852	4.883	4.796
27	4.477	4.357	4.511	4.635	5.778	5.050	5.017
28	4.663	4.564	4.691	4.710	5.050	5.056	5.024
29	4.301	4.344	4.431	4.389	5.465	5.313	5.283
30	4.395	4.344	4.349	4.403	5.343	5.133	5.112
31	4.369	4.111	4.431	4.407	5.468	5.236	5.075
32	4.077	4.059	4.139	4.423	4.944	4.781	4.835
33	4.317	4.277	4.043	4.159	4.007	4.190	4.357
34	4.043	3.829	4.025	4.807	4.078	4.220	4.454
35	4.007	3.871	3.892	4.174	4.190	4.382	4.522
36	3.989	4.009	4.205	4.159	4.043	4.403	4.575
37	4.382	4.248	4.419	4.554	5.753	4.997	4.963
38	4.394	4.263	4.369	4.615	5.727	4.997	4.963
39	4.419	4.174	4.477	4.454	5.485	5.257	5.100
40	4.543	4.407	4.605	4.736	5.215	5.124	5.069

Subject	4_1_4	4_1_5	4_1_6	4_1_7	4_1_8	4_1_9	4_2_1
1	5.069	5.043	4.828	5.081	5.106	4.913	4.489
2	4.796	4.595	4.500	4.673	4.644	4.489	4.836
3	5.176	5.130	5.017	5.118	5.124	5.037	5.176
4	5.288	5.088	4.934	5.204	4.977	4.875	4.466
5	4.779	4.615	4.533	4.762	4.691	4.585	4.543
6	5.236	5.476	5.631	5.193	5.403	5.541	5.476
7	4.927	4.796	4.564	4.615	4.635	4.644	4.277
8	5.381	5.361	5.280	5.211	5.315	5.226	5.376
9	4.522	4.511	4.431	4.357	4.454	4.419	4.511
10	5.412	5.412	5.656	5.811	5.979	5.948	5.088
11	4.543	4.605	4.477	4.477	4.522	4.585	4.419
12	4.796	4.754	4.564	4.522	4.585	4.407	4.290
13	4.762	4.762	4.595	4.625	4.644	4.419	4.357
14	4.754	4.812	4.828	4.718	4.745	4.663	4.625
15	5.088	5.063	4.852	5.100	5.124	4.934	4.522
16	5.050	5.024	4.804	5.063	5.088	4.890	4.454
17	5.112	5.063	4.942	5.050	5.056	4.963	5.112
18	5.136	5.088	4.970	5.075	5.081	4.990	5.136
19	4.875	4.736	4.489	4.543	4.564	4.575	4.174
20	5.004	4.883	4.673	4.718	4.736	4.745	4.419
21	4.290	4.407	4.431	4.407	4.500	4.431	3.738
22	4.344	4.407	4.500	4.554	4.554	4.431	3.892
23	4.407	4.443	4.489	4.394	4.466	4.344	3.829
24	4.344	4.431	4.543	4.443	4.635	4.585	3.932
25	5.182	5.069	5.278	5.283	5.011	5.394	4.682
26	4.997	4.970	4.736	5.011	5.037	4.828	4.357
27	5.069	5.226	4.977	4.883	5.100	5.130	5.176
28	5.094	5.056	4.997	5.037	5.081	4.956	5.283
29	5.550	5.282	5.138	5.399	5.143	5.326	4.990
30	5.447	5.110	4.999	5.252	4.993	5.155	5.045
31	5.438	5.215	4.956	5.215	5.088	4.883	5.513
32	5.033	4.808	4.725	4.838	4.962	4.963	4.571
33	4.190	4.394	4.331	4.394	4.691	4.454	3.367
34	4.190	4.174	4.331	4.394	4.382	4.174	3.526
35	4.331	4.431	4.344	4.205	4.344	4.060	3.829
36	4.205	4.220	4.419	4.220	4.522	4.394	3.970
37	5.017	5.182	4.920	4.820	5.050	5.081	5.130
38	4.977	5.118	4.820	4.771	5.088	5.153	5.118
39	5.455	5.236	4.984	5.236	5.112	4.913	5.529
40	5.215	5.106	4.942	5.017	5.118	5.100	5.407

Subject	4_2_2	4_2_3	4_2_4	4_2_5	4_2_6	4_2_7	4_2_8
1	4.727	4.745	4.554	4.691	4.700	4.605	5.024
2	4.970	4.997	4.875	4.883	4.977	4.779	4.934
3	5.371	5.521	5.153	5.220	5.421	5.043	5.283
4	4.407	4.554	4.575	4.511	4.554	4.489	4.522
5	4.615	4.796	4.595	4.533	4.745	4.585	4.727
6	5.557	5.451	5.521	5.624	5.642	5.278	5.455
7	4.220	4.635	4.290	4.317	4.522	4.143	4.277
8	5.511	5.869	5.437	5.514	5.821	5.355	5.667
9	4.663	4.927	4.554	4.585	4.898	4.489	4.736
10	5.517	5.775	5.147	5.242	5.649	5.429	5.717
11	4.635	4.927	4.511	4.605	4.787	4.443	4.787
12	4.369	4.431	4.290	4.290	4.304	4.159	4.190
13	4.419	4.511	4.369	4.382	4.431	4.220	4.304
14	4.710	4.852	4.673	4.654	4.796	4.477	4.575
15	4.754	4.771	4.585	4.718	4.727	4.635	5.043
16	4.700	4.718	4.522	4.663	4.673	4.575	5.004
17	5.318	5.476	5.088	5.159	5.371	4.970	5.226
18	5.338	5.493	5.112	5.182	5.389	4.997	5.247
19	4.111	4.564	4.190	4.220	4.443	4.025	4.174
20	4.369	4.736	4.431	4.454	4.635	4.304	4.419
21	4.078	4.357	3.738	3.970	4.357	4.304	4.419
22	4.357	4.466	3.932	4.060	4.357	4.407	4.454
23	4.331	4.595	3.829	4.060	4.477	4.290	4.500
24	4.443	4.522	3.932	4.043	4.369	4.419	4.644
25	4.787	4.913	4.779	4.860	5.017	4.796	4.934
26	4.625	4.644	4.431	4.585	4.595	4.489	4.949
27	5.182	5.193	5.165	5.124	5.182	4.905	5.170
28	5.517	5.730	5.313	5.357	5.620	5.236	5.553
29	5.201	5.235	4.999	5.192	5.026	4.830	5.023
30	5.201	5.292	5.074	5.305	5.223	4.984	5.141
31	5.497	5.591	5.509	5.460	5.468	5.112	5.100
32	4.564	4.825	4.607	4.561	4.672	4.480	4.731
33	4.143	4.277	3.401	3.738	4.159	4.007	4.234
34	4.143	4.344	3.689	3.761	4.111	4.174	4.248
35	4.382	4.700	3.892	3.932	4.554	4.344	4.443
36	4.624	4.431	3.714	3.968	4.159	4.190	4.701
37	5.136	5.147	5.118	5.075	5.136	4.844	5.124
38	5.118	5.124	5.075	5.017	5.043	4.762	5.069
39	5.513	5.606	5.525	5.476	5.485	5.136	5.124
40	5.380	5.572	5.421	5.357	5.442	5.231	5.352

Subject	4_2_9	4_3_1	4_3_2	4_3_3	4_3_4	4_3_5	4_3_6
1	4.844	4.304	4.419	4.419	4.290	4.220	4.234
2	4.804	4.382	4.431	4.394	4.331	4.263	4.277
3	5.517	4.736	4.828	4.804	4.762	4.718	4.691
4	4.682	4.500	4.407	4.477	4.533	4.357	4.382
5	4.984	4.317	4.290	4.317	4.357	4.220	4.290
6	5.497	4.762	4.820	5.004	4.771	4.787	5.017
7	4.585	4.454	4.443	4.511	4.419	4.344	4.317
8	5.965	4.775	4.897	4.867	4.776	4.673	4.597
9	5.056	4.290	4.277	4.248	4.159	4.094	4.190
10	5.916	5.011	5.226	5.278	5.050	5.252	5.323
11	4.970	4.454	4.431	4.625	4.443	4.419	4.554
12	4.174	4.234	4.344	4.454	4.234	4.220	4.317
13	4.304	4.290	4.419	4.543	4.290	4.277	4.394
14	4.736	4.263	4.466	4.357	4.220	4.220	4.248
15	4.868	4.344	4.454	4.454	4.331	4.263	4.277
16	4.820	4.263	4.382	4.382	4.248	4.174	4.190
17	5.472	4.635	4.736	4.710	4.663	4.615	4.585
18	5.489	4.673	4.771	4.745	4.700	4.654	4.625
19	4.511	4.369	4.357	4.431	4.331	4.248	4.220
20	4.691	4.575	4.564	4.625	4.543	4.477	4.454
21	4.466	3.892	4.111	4.220	3.829	3.892	4.025
22	4.407	4.127	4.357	4.454	4.060	4.127	4.290
23	4.511	3.989	4.220	4.357	3.912	3.912	4.111
24	4.644	4.159	4.317	4.419	4.078	4.094	4.174
25	5.030	4.564	4.431	4.522	4.522	4.431	4.477
26	4.754	4.143	4.277	4.277	4.127	4.043	4.060
27	5.293	4.745	4.736	4.736	4.564	4.543	4.585
28	5.642	4.868	4.942	4.934	4.883	4.898	4.828
29	4.950	4.324	4.421	4.633	4.475	4.295	4.288
30	5.058	4.398	4.433	4.705	4.513	4.254	4.382
31	5.187	4.700	4.663	4.615	4.419	4.407	4.477
32	4.875	3.943	3.980	4.384	3.921	3.907	4.024
33	4.248	4.094	4.331	4.263	3.970	3.989	4.094
34	4.289	3.989	4.205	4.331	3.761	3.850	4.025
35	4.644	3.689	4.025	4.174	3.434	3.761	4.094
36	4.786	3.893	4.159	4.263	3.807	3.892	3.871
37	5.252	4.673	4.663	4.663	4.477	4.454	4.500
38	5.198	4.615	4.663	4.682	4.443	4.382	4.454
39	5.209	4.736	4.700	4.654	4.466	4.454	4.522
40	5.501	4.585	4.615	4.718	4.369	4.382	4.533

Subject	4_3_7	4_3_8	4_3_9
1	4.143	4.304	4.263
2	4.143	4.190	4.190
3	4.635	4.727	4.745
4	4.407	4.277	4.407
5	4.304	4.277	4.357
6	4.635	4.844	5.017
7	4.511	4.357	4.263
8	4.706	4.697	4.722
9	4.060	4.094	4.248
10	4.745	4.977	5.159
11	4.466	4.357	4.554
12	4.007	3.989	4.043
13	4.078	4.127	4.127
14	4.159	4.174	4.205
15	4.190	4.344	4.304
16	4.094	4.263	4.354
17	4.522	4.625	4.644
18	4.564	4.663	4.682
19	4.431	4.263	4.159
20	4.625	4.489	4.407
21	4.190	4.205	4.205
22	4.248	4.331	4.248
23	4.159	4.317	4.290
24	4.248	4.317	4.290
25	4.357	4.382	4.419
26	3.951	4.143	4.094
27	4.615	4.635	4.564
28	4.710	4.875	4.852
29	4.320	4.431	4.353
30	4.320	4.349	4.366
31	4.575	4.836	4.710
32	3.929	4.139	4.199
33	4.369	3.970	4.407
34	4.453	4.159	4.060
35	4.094	4.304	4.522
36	4.025	4.111	4.060
37	4.533	4.554	4.477
38	4.454	4.543	4.511
39	4.615	4.868	4.745
40	4.394	4.727	4.868

VITA

Howard W. Rasey was born in Jacksonville, Florida on September 10, 1967. After elementary education in Harper's Ferry, West Virginia, he attended The Principia in St. Louis, Missouri for junior and senior high school, graduating in May 1985. He received an Associate of Arts degree in May 1990, from St. John's River Community College in St. Augustine, Florida. In May 1992, he received a Bachelor of Arts degree from the University of North Florida in Jacksonville, with a major in psychology and a minor in behavioral medicine. During two years of master's study at the University of West Florida in Pensacola, he began to develop a more serious interest in health related issues while conducting research at the Center for Behavioral Medicine. Howard transferred to the University of Tennessee, Knoxville in August 1994 to begin doctoral training under the direction of Joel F. Lubar, Ph.D. In 1998, he received his doctoral degree in experimental psychology. He is currently working at Physicians' Theta Control Center in Cleveland, Ohio as the director of applied psychophysiology.