

**A STUDY OF ATTENTION DEFICIT HYPERACTIVITY DISORDER
IN AN ADULT SAMPLE WITH PROBLEM BEHAVIORS**

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IN AN ADULT SAMPLE WITH PROBLEM BEHAVIORS

An Abstract

Presented to the
Graduate and Research Council of
Austin Peay State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts in Psychology

by
Philip Dulberg
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ABSTRACT

This study investigated symptoms of ADHD as reported by a sample of prison inmates, using Q-technique to group together individuals with similar scoring patterns. Additionally, a comparison group of GED students was included. All subjects were measured with the Residual Attention Deficit Inventory, evaluating the strength of the three components associated with ADHD: inattention, impulsivity, and overactivity. Accompanying problems, such as educational difficulties, emotional problems, and substance abuse, were also determined by means of a checklist, and these were compared to the ADHD components.

The instrument was measured for internal consistency and reliability, and it proved to be very high in this regard. However, high intercorrelations between the three components were also found.

Q-technique was used to create groups of subjects scoring similarly. This proved largely unsuccessful, since one group comprised over half of the sample and several groups had only one member. Observations were made concerning the groupings and the characteristics of the individuals in them nevertheless.

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To the Graduate and Research Council:

I am submitting herewith a Thesis written by Philip Dulberg entitled "A Study of Attention Deficit Hyperactivity Disorder in an Adult Sample with Problem Behaviors." I have examined the final copy of this paper for form and content and I recommend that it be accepted for the degree of Master of Arts with a major in Psychology.


Major Professor

We have read this thesis and
recommend its acceptance:


Second Committee Member


Third Committee Member

Accepted for the Graduate and
Research Council:


Dean of the Graduate School

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CHAPTER 1

Review of the Related Literature

The Nature of ADHD

In recent years, Attention Deficit Hyperactivity Disorder (ADHD) has become somewhat of a "buzzword" in education and psychology circles. This relatively new term was first used in the Diagnostic and Statistical Manual of Mental Disorders, version III-Revised (1987) (DSMIII-R). However, the disorder has been recognized and studied for many years under various names: hyperkinesis, minimal brain dysfunction, ADD with or without hyperactivity, and hyperactivity. (For the sake of clarity, the term ADHD will be used throughout this presentation, even when reporting research which uses other, synonymous terminology.)

ADHD is marked by three major components: inattention, manifested by symptoms such as distractibility and shifting from one activity to another before completion; impulsivity, shown by interrupting and intruding on others, blurting out answers to questions before they have been completed; overactivity, displayed by fidgeting, restlessness, inability to remain seated, etc. Those afflicted with ADHD often display academic underachievement, as well as low self-esteem, poor frustration tolerance, moodiness, and temper control

problems; it is far more prevalent in males than females (Sattler, 1992). Diagnosis is a problem due to imprecision in detecting its characteristic deficits: for example, what is perceived as "all boy", exuberant activity by a tolerant parent may well be seen as disruptive and problematic by a perplexed teacher. Little is known of the etiology of the disorder; theories range from brain dysfunction to food allergies. The most prevalent and successful treatment thus far has been medication (Sattler, 1992).

To date, the vast majority of ADHD-related research has focused on children, mainly because the disorder is so prominently displayed in the school setting, where attention and self-control are essential for success and problems are easy to spot. ADHD adults are much more difficult to find, since many have learned coping skills and blended into the working world relatively unnoticed. Many do so, but some are not so fortunate.

This study examines characteristics of a group of adults, many of whom are criminals, seeking to identify commonalities among groups who score similarly on a test of ADHD-related symptoms. It might be tempting to predict that, if found, such commonalities would shed light on what constitutes a "criminal personality". Such a prediction, however, would be a serious overstatement, since such a personality type has proven most difficult to pinpoint.

Views of Research in Personality

One reason for this is that the determinants of personality itself are not clear. (We might define it as an individual's unique constellation of consistent behavioral traits [Weitan, 1992]). Some take a mentalistic view, explaining how a person thinks, feels, acts, and reacts by a series of "intrapsychic mental processes. The biological view identifies biological factors as having primary influence on human behavior. The environmental approach locates the main causal factors for individual functioning in the environment." (Magnusson & Torestad, 1993, p. 431) While a truly comprehensive theory of personality must integrate these viewpoints, most research is in specialized areas, shedding little light on the overall picture. In addition, research generally investigates hypothetical variables, or constructs, the value of which can never be certain when theory meets reality. This specialized approach has led to much research into various aspects of personality, perhaps causing us to lose sight of the fact that these parts interrelate to create a unique, whole individual, a blend of mental, biological, and environmental, of past experience and present situation.

As difficult as it is to explain behavior in terms of personality theory, it is perhaps even more difficult to predict it. The uniqueness of the individual's mental and

biological makeup is one detriment to prediction, as are the unique set of events each person experiences, his/her perceptions of them, and their effect on subsequent behavior. Given the near impossibility of accurate prediction, Magnusson and Torestad (1993) argue that we should not even attempt to make it a goal of research; rather, we should use prediction only as a tool to aid in decision-making.

The techniques most frequently employed in personality research (Pearson correlation, ANOVA, etc.) focus on hypothetically drawn constructs to find relationships between them and to ultimately allow us to make statements as to cause and effect. Sometimes these conclusions are impossible to support. One shortcoming of this approach centers on the interdependence of each variable to all others: if that variable is taken out of its context, is it still meaningful? Another is the inevitable comparison of an individual's unique features to norms. Results, then, apply to the "average", yet "concepts of the average child and the average situation are abstractions that have no utility whatever in the investigation of dynamics" (Lewin, 1931, cited in Magnusson & Torestad, p. 444).

Another way to approach the problem is known as pattern analysis, wherein pattern description is used to group people into homogeneous categories according to their patterns of values on a given issue. Once grouped, those

within each group are compared for similarities and differences. The advantage of this technique is that it examines the subject holistically, looking at as many aspects of the individual as possible. The glaring disadvantage is that it does not allow us to do more than notice similarities and differences; we cannot attempt to "prove" anything. As Magnusson and Torestad (1993) state: "it does not investigate the dynamics of the processes in individual functioning, neither in a current, nor in a developmental manner" (p. 445). Perhaps it is this lack of precision, this generality of pattern analysis techniques that has led to their relative lack of popularity as research methods. One wonders if the search for "the norm" has caused us to ignore the value of the individual. Surely there is something to be learned from a holistic view, and the present research attempts to illustrate that point. It must be stressed that it is essential not to attempt to assign too much importance to any findings, but rather to use them to open new doors for further research. Hence, this study must be seen as strictly exploratory in nature.

The primary statistical method used in this study is Q-technique. Perhaps its applicability is best delineated by a brief overview of the method. Stephenson (1953) explained that Q-technique provides a systematic way to objectify a subjective thing: a person's thoughts or

beliefs. Typically, a person is asked to respond to a large number of statements covering a spectrum of feelings or opinions on a given topic. From the answers given, that person may be compared to others regarding the issue in question. Q-technique is essentially the inverse of R-technique; in R-methodology, correlations between variables are calculated by clustering, while in Q it is the people who are clustered. If we wish to examine relationships among people, as opposed to variables, Q becomes a viable option (Carr, 1992). While establishment of cause and effect relationships is beyond the scope of both Q and R techniques, Q carries one distinct advantage: it is concerned with asking questions as well as finding answers, allowing us to make suppositions about cause and effect to be proved or disproved in later research, a luxury not afforded by the strict nature of R-methodology.

Another advantage of this method is that it does not require a large sample, as is the case with R-techniques. Rather, Q "tests theories on small sets of individuals carefully chosen for their 'known' or presumed possession of some significant characteristics" (Kerlinger, 1986, as cited in Carr, 1992, p. 521). This makes it an effective measure of a person's attitudes and motivations, which is why it was chosen as a statistical technique for this research.

Criminality and Personality

When the construct of criminality is added to the already puzzling area of personality, little consensus emerges. Early in this century it was thought that people committed crimes because of a genetic predisposition to do so, thereby making the criminal not responsible for his/her actions. Theorists such as Lombroso, Sauer, and Kretchmer linked physical anomalies to criminality, reinforcing the idea of predisposition (Levy, Southcombe, Cranor, & Freeman; 1950). Advancements in clinical psychology and the advent of personality tests have led to much reassessment of the concept of the "criminal personality".

Considerable research was devoted in the 1930s, '40s, and '50s toward identifying this personality type. Schuessler and Cressey (1950) reviewed 113 such studies, only to conclude that it is impossible to make a connection between criminality and personality elements (Gough and Peterson, 1952). This quest has continued to interest researchers, although findings remain inconclusive. Monahan (1981), on one hand concurs with the view that violence is impossible to predict. Other research suggests, however, that aggressiveness does tend to remain stable over time (Olweus, 1979; Moskowitz, Schwartzmann, & Ledingham, 1985). Longitudinal studies have indicated that an aggressive child will tend to become an aggressive adolescent, and eventually an adult with a propensity

toward violence (Cornell, 1987). If we cannot pinpoint a personality geared toward crime, can we at least find aspects which might predict criminality? Impulsivity, the tendency to act before considering the consequences of that act, is one such aspect which has attracted considerable investigation. It is also of particular relevance to this research. Stanton (1969) studied the self-control system of criminals to determine whether those who commit violent crimes, considered to be more impulsive in nature than non-violent offenses (Kelley, 1972), suffer from a poorly developed system of self-control. Surprisingly, he found this not to be the case. Rather, the criminal who commits a violent, impulsive crime may possess adequate self-control, but the act is a product of exceptional circumstances; thus, violent crime may be considered "crime of passion". This conclusion flies in the face of prior assumptions about antisocial behavior, which held that poor impulse control is a pervasive characteristic rather than an isolated response to a peculiar situation (Glueck & Glueck, 1950, cited in Heilbrun, Knopf, & Bruner, 1976).

Heilbrun et al. (1976) investigated this controversy by comparing subsequent parole records of violent versus non-violent offenders, hypothesizing that if a violent (impulsive) criminal does indeed have a poorly developed self-control system, he/she would be more likely to violate parole than a non-violent (non-impulsive) criminal. They

found just the opposite: violent offenders, according to this research, violate parole significantly less than their non-violent counterparts, despite the fact that the violent offenders had rated themselves lower in self-control during commission of the crime (by a self-report questionnaire) than the non-violent group. Thus, Heilbrun et al. (1976) concluded that violent criminals are, for the most part, in good control of their actions, but exceptional circumstances have caused them to act impulsively. That is to say, the more impulsive (and violent) the crime, the less the likelihood that its perpetrator will commit another offense. Clearly, this research points away from the idea that impulsivity is a characteristic of a "criminal personality".

Farrington (1990) put forward a theory integrating many previous explanations; a central tenet is the assumption that criminal tendency depends partly on motivation, partly on internalized beliefs. He studied subjects longitudinally, creating a test of antisocial tendencies and applying it to the cohort (Farrington & West, 1990). The conclusion reached was that for the most serious offenders, an antisocial personality had already been formed by age 18, and commission of crime is just one aspect of that larger syndrome. Farrington found five factors of that personality to have predictive value: poor child-rearing skills by parents; family deviance; school

problems; ADHD-type behavior (high daring, poor concentration or restlessness, high psychomotor impulsivity); and antisocial childhood behavior.

The factor of ADHD merits further discussion for its relevance to this research. Of the boys (all subjects were males) identified at age 8-11 as "high daring" (121 of 411), 57% were later convicted of crime, compared to 29.3% of those not so labeled. In the group designated "lacks concentration or restless" (82 of 411), 50% became convicts, compared to 33.8% of those not in that category. Those considered "high psychomotor impulsivity" were convicted (104 of 411) were convicted at a 50% rate, while those not in that group showed a 32.9% conviction rate. According to Farrington, whether or not a person commits a crime depends on what the act will provide and the perceived probabilities of success or failure. Since impulsive people fail to consider the consequences of their actions, they are more likely to commit crimes. That is, they see the opportunity and benefit but act before weighing the chance of success. He also concluded that boys aged 14-20 have a combination of high desire for material goods, little chance of obtaining them legally, and higher impulsivity than other age groups, thus explaining a higher rate of offending at this age (Farrington, 1990).

While such theories include impulsivity as a component in criminality, other evidence exists which minimizes its importance. Oas (1985) studied incarcerated juvenile delinquents to measure impulsivity, and while he found it to be present in 8 of 33 subjects, found no relation to either number or severity of offenses.

Severity, or degree of violence, must be considered in any discussion of crime. Heilbrun (1979) studied the relationship between psychopathy and violence, concluding that level of cognitive functioning, or intelligence, is an intervening variable in this relationship. That is, a low functioning psychopath is more prone to violent crime than an intelligent one. The latter would be less likely to act impulsively as well. For example, in a barroom argument, the intelligent psychopath would be less likely to end up in a fight than a low functioning counterpart, due to the latter's diminished capacity to consider consequences and alternatives (Heilbrun, 1979). According to a classification system used by the FBI, violent crime is that in which force is used against people (Kelley, 1972). Murder, manslaughter, rape, assault, and robbery are classified as such. Burglary, larceny, car theft, forgery, drug violations, and arson fall into the category of non-violent crime.

Heilbrun (1979) has classified crimes in terms of their relative degree of premeditation. Listed from least

to most premeditated, they are (a) manslaughter, (b) murder, (c) assault, (d) rape, (e) auto theft, (f) robbery, (g) drug violation, (h) larceny, (i) burglary, (j) forgery, (k) arson.

In comparing the FBI list of violent crimes to Heilbrun's list of impulsive crimes, we see that five of the six most impulsive are also considered violent. (Car theft, fifth on the Heilbrun list, is the exception, but with the recent rash of "carjacking" and its ensuing violence, we might well consider that a violent offense as well).

Erez (1980) investigated the relationship of the severity of crime to impulsivity. She found no significant differences in number of property-related offenses between those who planned their actions and those who didn't (impulsives). However, impulsive offenders were found to commit more crimes generally, and their behavior was more often violent. Violence has also been linked to ADHD in other research. One study (Loney, Whaley-Klahn, Kosier, & Conboy, 1983) compared criminal behavior of 22 hyperactive young men and their non-hyperactive brothers, finding significance between the disorder and violence. Results indicated that 45% of ADHDs were diagnosed as having Antisocial Personality Disorder, as opposed to 18% of their brothers. Criminal records were not used here, however; violence was considered to be: carrying a gun or knife,

engaging in a fight where weapons were used, or threatening to or almost hurting someone.

Brennan and Mednick (1990) studied childhood ADHDs and adult crime as well, seeking a relationship between the severity of the two. They found that those labeled "pervasively hyperactive" (rated as hyperactive by teacher, parent, and neurologist) were more likely to be violent offenders later in life than those termed "situational" (rated hyperactive by two judges or one), or those not rated as hyperactive at all.

In a study of characteristics of rapists and child molesters, Overholser and Beck (1986) found social skills deficits, higher anxiety, and greater fear of negative evaluations, but they did not find the deviant subjects to be more impulsive than controls. This led the researchers to conclude that there may be no single variable to which to identify such offenders. They also determined that rapists and molesters may well be able to control their urges unless they are provoked; such urges may often be inhibited by the use of drugs or alcohol, an interesting idea given the commonly held view that alcohol and drugs lower inhibitions.

Of the characteristics under consideration in the present research, the combination of two characteristics, impulsivity and overactivity, is seemingly of particular relevance to criminal behavior. Surely all of us have had

thoughts of wrongdoing in our lives. Why are most of us able to not act on these thoughts, while criminals transfer them into antisocial deeds? Is it that they feel a necessity to act (overactivity) and cannot help themselves? Do they fail to properly evaluate the consequences of their actions (impulsivity)? These two factors contribute to impulse control. Overactivity provides the spark, or urge, to act. Whether or not this urge is carried out depends in part on the degree of impulsivity. A lack of impulse control is considered to be one major component of what Kozol, Boucher, and Garofolo (1972) term "dangerousness." This term is generally used synonymously with violence (Monahan, 1975), referring to crimes committed against people.

If we are to accept impulsivity and its control as integral to dangerousness, we would expect delinquents to display higher levels of impulsivity than non-delinquents. Saunders, Repucci, and Sarata (1973) investigated this issue, administering the Barratt Impulsivity Scale and the Hirschfield Scale (both self-report scales) with the Matching Familiar Figures Test. Their findings revealed no significant differences between delinquents and controls, with one glaring exception: on the Hirschfield Scale, the control group (high school students) measured significantly higher in impulsivity than the delinquents!

One conclusion which emerges from virtually all

studies which attempt to predict dangerousness is that violence is highly overpredicted; that is, a great many false positive diagnoses are made (Monahan, 1975). The reason for this unfortunate circumstance is this: due to the lack of precision in making such decisions, care must be taken to not allow dangerous people to go free. Therefore, it becomes necessary to risk unfairly incarcerating those misdiagnosed, despite the stigmatization and emotional scars such a misdiagnosis may cause. Saunders et al (1975) drew this conclusion: the construct measured by commonly used tests of impulsivity (i.e. questionnaires with rating items such as, "I like to do things on the spur of the moment") has little relation to actual impulsive behavior. In other words, we must use caution in attempting to determine someone's level of impulsivity and predicting behavior from it, because "mental health professionals become saddled with a vocabulary that has no real ability in explaining or predicting human behavior" (p. 794).

Contrary to these conclusions , other research suggests that aggressiveness does tend to remain stable over time (Olweus, 1979) (Moskowitz, Schwartzmann, & Ledingham, 1985). Longitudinal studies have indicated that an aggressive child will tend to become an aggressive adolescent and eventually an adult with a propensity toward violence (Cornell, 1987). Schmauck (1970) investigated

learning skill of psychopaths versus controls, and he found that while the psychopaths showed relatively deficient passive avoidance learning skills when failure to learn was reinforced by punishment, their learning surpassed controls when money was used as a reward. Thus, the deviant subjects displayed an enhanced ability to pay attention to certain punishment producing stimuli if given the right reward.

The role of genetic and physiological factors in antisocial behavior was studied by Raine and Duncan (1990). They found that reduced skin conductance, EEG profiles, and resting pulse levels were common characteristics of criminals; this led the researchers to conclude that "underarousal may be causally linked to crime." Reduced arousal was determined to be an underlying determinant of many of the performance deficits displayed by those who commit antisocial acts. Raine and Venable (1987) measured the degree of selective attention among antisocial children compared to prosocial controls, finding the antisocial group to have greater selective attention.

Jutai, Hare, and Connolly (1987) tested psychopathic adults in the same area and obtained similar results: psychopathic adults displayed greater selective attention. These bodies of research, then, suggest that both children and adults who displayed socially deviant behavior were better able than normal peers to pay attention to stimuli

which interested them.

Arousal is a point of contention among researchers of ADHD. Is the disorder caused by overarousal, underarousal, neither, or both? Rapoport and Ferguson (1981) reviewed considerable literature indicating underarousal of the central nervous system as a factor in at least some cases. Studies by Laufer, Freibergs, and Buckley (cited in Weiss & Hechtmann, 1986) support the opposite view, suggesting that overarousal causes the problem. Douglas (cited in Weiss & Hechtmann, 1986), on the other hand, theorized that both over- and underarousal may occur, depending on the situation, and the problem is one of improper regulation of arousal. Other research (Ferguson & Simpson, and Barkley & Jackson, [cited in Weiss & Hechtmann, 1986]) found no differences in arousal levels between ADHDs and normal controls.

The role of EEG measurement in ADHD evaluation is also controversial and uncertain, since some ADHDs (35-50%) have abnormal readings but others do not, and the types of abnormalities are varied (Cantwell, cited in Weiss & Hechtmann, 1986). Furthermore, Satterfield, Cantwell, Saul, & Usin (1974) failed to find differences in ADHDs with abnormal EEGs from those with normal readings in intelligence, achievement, or behavior, in school or at home (while at the same time noting higher anxiety and restlessness for the former group in both environments).

Weiss and Hechtmann (1986) tested ADHDs and controls with EEGs over a ten year period at approximately 9 and 19 years of age, finding that a significant number of abnormal initial readings had become normal ten years later. The investigators concluded that EEG abnormalities are caused by immaturity and that normalization occurs as later-developing adolescents mature. Research on the effects of ADHD on adult behavior has yielded typically divergent findings.

Menkes, Rowe, and Menkes (1987) studied subjects retrospectively over 25 years, finding a significant outcome of psychosis (4 of 14), which superseded antisocial behavior as the primary concern for adult outcome, according to the investigators. Laufer (1971, cited in Weiss & Hechtmann) followed subjects for 12 years and found that 30% of ADHDs had been in trouble with police. Borland and Heckman (1976) found childhood records of men which indicated presence of the disorder, and these men were compared to their normal brothers. The ADHD men were found to be having more problems with work, lower socioeconomic status, and a higher incidence of psychiatric difficulties than their brothers. They changed jobs more often and had more job-related and marital problems. These findings led the researchers to conclude that the problems were likely caused by ADHD-related factors such as impulsivity, nervousness, anxiety, and temper control problems. It must

be noted, however, that these problems were not severe, and most subjects were high school graduates, working steadily, and self-sufficient. Also, antisocial behavior was not a problem for subjects in this study. It is interesting to compare these findings to those of the previously mentioned work by Loney, Whaley-Klahn, Kosier, and Conboy (1981), which also compared ADHD men to their non-afflicted brothers, with indications of considerably more serious difficulty for ADHDs in adult life.

Weiss and Hechtmann (1986) assessed adult ADHDs and controls for chronic antisocial problems, using DSMIII-R (1980) criteria. They found that 1 of 41 controls met these criteria, compared to 14 of 61 ADHDs. However, analysis of the same subjects using different criteria, those of the Schedule for Affective Disorders and Schizophrenia, Lifetime Version (SADS-L), produced drastically different results: 0 controls and only 1 ADHD met criteria for Antisocial Personality according to this measure.

Throughout this examination of research we see such findings which are divergent, conflicting, and lacking in consensus. Many factors might contribute to this ambiguous body of research. Time, for example, is influential on results, due to the severe rise in crime rates and prevalence of carrying weapons in recent years. Geography also plays a role: a study done in New York City or Miami

is likely to differ from one done in Lincoln, Nebraska, for instance. Vast differences in methodology are also important variables, since self-report is likely to differ from court records, which will differ from parental interviews, etc. Qualifying criteria have also been seen as an important factor in research outcome.

Lack of consensus may also be attributed to confounding variables inherent in such research. Family situation, school intervention, socioeconomic status, IQ, medication, peer relationships -all of these affect a person's ability to cope with the difficulties of everyday life. While those severely afflicted with ADHD are likely to emerge from any research as having problems, less extreme cases, comprising the vast majority of those with the disorder, may slip through the cracks of research.

Similarly, many ADHDs slip unnoticed into society after leaving school. Yet while some research indicates that most are productive, hard working, average citizens, other studies suggest considerable difficulty. In Borland and Heckman's (1976) research, ADHDs worked more hours, often at second, part-time jobs, than did their normal brothers; self sufficiency and rate of full-time employment were comparable. Weiss, Hechtman, and Perlmann (1978) found that a group evaluated as having the disorder in their last year of school was rated as no different from controls when in the work force one year later, as

evaluated by employers. The researchers speculated that ADHDs gravitated toward work which minimized their deficits (high activity, low concentration jobs), whereas those deficits had been highlighted in the school setting.

Yet despite the similarities between groups, differences were found as well. ADHDs changed jobs more frequently, were more likely to feel that certain aspects of a job were too difficult, were less likely to continue their education (understandably), and were more likely to be laid off. Thus, we see qualitative differences in ADHDs' work records, even though quantitatively they are the equal of their coworkers.

The present investigation seeks to examine ADHD-related characteristics (impulsivity, inattention, and overactivity) as they occur in two groups which might be prone to difficulties in these areas, criminals and high school dropouts. Rather than comparing them to norms, however, they will be compared to each other in an effort to find similarities among people; then groups of similar individuals will be formed and investigated holistically. By doing this, we hope to find patterns of characteristics, attitudes, and behaviors which will enable us to make statements about these people which invite further research, or at the least, ask new questions which provoke further consideration. Among the questions to be asked here are: do violent criminals have greater incidence of

impulsivity, inattention, and/or overactivity than non-violent counterparts? Do those with similar incidence of the ADHD-related symptoms share past difficulties in other areas, such as academic problems, need for special education, trouble with peers and authorities, alcohol and drug abuse, and psychiatric history?

Specifically, this research explores two areas: first, the psychometric properties of the Residual Attention Deficit Disorder Inventory (RADDI) itself will be examined; second, it will evaluate the use of Q-methodology for exploring small groups of subjects.

CHAPTER 2

Methods and Results

Subjects for this research were 45 adults, 28 of whom were serving prison sentences in the Cheatham County Jail in Ashland City, Tennessee. Inmates were asked to volunteer to fill out a questionnaire regarding their behaviors, attitudes, problems, and past history. No incentives were offered for their participation, but all were told that they might be of assistance in understanding why some people get into trouble and others do not. It was made clear that all responses would be strictly confidential and that participation was not required of them. One inmate declined and was returned to his cell without question. Questionnaires were administered to groups of 1 or 2 at a time, with no time constraints, in a small cubicle where lawyers confer with inmates. Jail personnel were not present or monitoring the administrations. All inmates at the facility were asked to participate in the study, with the exception of those unavailable because they were serving on a work-release program.

The 17 GED students who participated were enrolled in night classes in Ashland City, Tennessee. They also were informed that participation was voluntary and confidential.

They were asked to take the form home and return it when completed. Several chose not to do so, and they were not questioned further.

The questionnaire used was the Residual ADD Inventory (RADDI) (Hunt, 1984). It consists of 85 items designed to detect the presence of the disorder in adults. Each item was determined to investigate one of the ADHD-related components, with the following distribution: inattention, 27 items; impulsivity, 26 items; overactivity, 20 items. Twelve items did not fit into any of the categories, and these items were omitted from the scoring; a total of 74 items remained. Items are rated on a 5-point Likert scale, ranging from 0 (never) to 4 (always). Additionally, the measure seeks background information into subjects' educational and personal histories by use of a checklist. Four numerical scores are produced, one for each of the three components of ADHD (impulsivity, overactivity, and inattention), as well as a total score for the combined factors.

Due to a lack of normative data regarding the reliability and validity of the instrument, a number of statistical measures were performed. Internal consistency reliability estimates were: for impulsivity, coefficient Alpha = .842; for overactivity, Alpha = .720; for inattention, Alpha = .851; for all items, Alpha = .926. These data indicate an extremely high degree of internal

consistency/reliability for the measure.

Pearson product moment correlation produced extremely high intercorrelations between variables: inattention and impulsivity correlated the most highly ($r = .821$), followed by inattention and overactivity ($r = .677$), and impulsivity ($r = .664$). This necessarily leads to the conclusion that the instrument does not effectively isolate the component parts. Rather, it is testing one variable, not three.

Table 1 summarizes the influence of problems usually associated with ADHD on scores on the RADDI. The table includes the means for all four RADDI scores for subjects who reported or did not report a variety of problems. Significant t-test results are also indicated.

Table 1

Influence of ADHD-related Problems on RADDI Scores.

| Characteristic: | Retained | Not Retained |
|--------------------|-------------------|----------------------|
| Number of Subjects | 21 | 24 |
| Inattention | 49.76* | 40.42 |
| Impulsivity | 53.29 | 46.00 |
| Overactivity | 41.76 | 37.08 |
| Total Score | 144.81* | 123.50 |
| Characteristic: | Behavior Problems | No Behavior Problems |
| Number of Subjects | 11 | 34 |
| Inattention | 53.09* | 42.09 |
| Impulsivity | 60.27* | 45.88 |
| Overactivity | 42.64 | 38.18 |
| Total Score | 156.00* | 126.15 |

Table 1 (cont'd)

| Characteristic: | Special Education | No Special Education |
|--------------------|-------------------|----------------------|
| Number of Subjects | 8 | 37 |
| Inattention | 54.38* | 42.70 |
| Impulsivity | 55.75 | 48.03 |
| Overactivity | 41.00 | 38.89 |
| Total Score | 151.13 | 129.62 |
| Characteristic: | Suspended | Not Suspended |
| Number of Subjects | 19 | 26 |
| Inattention | 44.89 | 44.69 |
| Impulsivity | 51.42 | 47.92 |
| Overactivity | 39.26 | 39.27 |
| Total Score | 135.58 | 121.88 |
| Characteristic: | Expelled | Not Expelled |
| Number of Subjects | 6 | 39 |
| Inattention | 57.33* | 42.85 |
| Impulsivity | 63.67* | 47.21 |
| Overactivity | 44.83 | 38.41 |
| Total Score | 165.83* | 128.46 |
| Characteristic: | Fights/Violence | No Fights/Violence |
| Number of Subjects | 11 | 34 |
| Inattention | 50.82 | 42.82 |
| Impulsivity | 55.64 | 47.38 |
| Overactivity | 41.82 | 38.44 |
| Total Score | 148.27 | 128.65 |
| Characteristic: | Alcohol Problems | No Alcohol Problems |
| Number of Subjects | 9 | 36 |
| Inattention | 48.11 | 43.94 |
| Impulsivity | 51.33 | 48.92 |
| Overactivity | 38.78 | 39.39 |
| Total Score | 138.22 | 132.25 |

Table 1 (cont'd)

| Characteristic: | Drug Problems | No Drug Problems |
|--------------------|---------------|------------------|
| Number of Subjects | 12 | 33 |
| Inattention | 49.58 | 43.03 |
| Impulsivity | 54.50 | 47.55 |
| Overactivity | 42.17 | 38.21 |
| Total Score | 146.25 | 128.79 |

| Characteristic: | Reading Problems | No Reading Problems |
|--------------------|------------------|---------------------|
| Number of Subjects | 14 | 31 |
| Inattention | 50.93 | 42.00 |
| Impulsivity | 55.57* | 46.61 |
| Overactivity | 42.21 | 37.94 |
| Total Score | 144.71* | 126.55 |

| Characteristic: | Math Problems | No Math Problems |
|--------------------|---------------|------------------|
| Number of Subjects | 11 | 34 |
| Inattention | 54.64* | 41.59 |
| Impulsivity | 53.91 | 47.94 |
| Overactivity | 41.36 | 38.59 |
| Total Score | 149.91 | 128.12 |

* $p < .05$

With two exceptions (suspended/not suspended on the overactivity variable, and alcohol problems/no alcohol problems with overactivity), all means were in the predicted direction; that is, scores were generally larger when the characteristic or problem was indicated as present, with many reaching statistical significance. These findings thus suggest relationships between the variables and several characteristics/problems, some of which merit discussion. Despite the previously mentioned

high degree of intercorrelation between the ADHD-related variables, inattention emerged alone as the significant factor among the retained/not retained subgroup while total scores differed significantly. While both inattention and impulsivity showed large differences along with total score for behavior problems, the overactivity variable is seen as much less important, a finding common to most comparisons here. Among those who had had special education, only inattention appeared to be a critical factor.

Results of the suspended/not suspended pairing are somewhat surprising. It might be expected that those who engage in misbehavior serious enough to merit suspension would tend to be more inattentive, overactive, or impulsive, but these findings indicate otherwise. In fact, the non-suspended group actually scored higher in one area, while all means show negligible differences. Expulsion, seemingly a related problem, produced markedly different scores, however. Differences among means were very large here, with all areas highly significant except overactivity. One might speculate that those with ADHD-related symptoms tend to quietly suffer with their deficits until they become so frustrated or fall so far behind their peers that they eventually "snap", causing a disturbance serious enough to warrant expulsion without prior suspension.

Violence, alcohol, and drugs produced no real

differences, a finding which differs from a large body of research linking each of these problems to ADHDs, but concurs with other findings such as those of Weiss and Hechtman (1986) which report insignificant differences in these areas. Reading problems emerged predictably high, reaching significance on all factors except overactivity. Math difficulties, however, showed extreme differences for inattention, somewhat less for total score, and negligible for impulsivity and overactivity. Such a result might reflect the importance of concentration in mathematical ability.

Scores of men and women were also compared. Since ADHD is a predominantly male disorder, as much as 10 to 1 (Sattler, 1992), it was expected that the 26 males would score higher on the test than the 19 females. In fact, females scored slightly higher on both inattention and overactivity, with males slightly higher on impulsivity. Means for the total score were nearly identical (males, $m=133.46$, females, $m=133.42$). It is speculated that this sample of prison inmates and GED students contains an unusually high number of women with ADHD-related problems, which might account in part for their being incarcerated or having dropped out of school.

The validity of the RADDI was further supported by correlating its scores with the component scores derived from principle components analysis of the problems checked.

A principle components analysis followed by varimax rotation produced five clear components, given the following labels according to high loadings: overactive-violent, emotional problems, learning problems, substance-related behavior problems, and depressed. Sums of these five problem areas were then correlated with the ADHD-related variables. The attention score was significantly correlated ($p < .05$) with emotional problems, learning problems, and depression. The impulsivity score was significantly related with emotional problems, learning problems, and overactivity-violence. The overactivity score was not correlated with any component problems, but total score was strongly related to emotional and learning difficulties, overactivity-violence, and depressed.

A total problems score was derived by adding the instances of all problems together. This total was correlated with the ADHD variables, with strong positive results. Inattention ($p < .001$), impulsivity ($p < .001$), and total score ($p < .001$) all showed extremely high correlation, while overactivity had a weaker but still significant relationship ($p < .05$).

Comparison of Prisoners to GED Students

In order to make comparisons between the prisoners and GED students, Pearson product moment correlations were performed in a number of areas, yielding the following results: GED students were retained more frequently, in

numbers approaching significance ($p=.06$). Prisoners were much more likely to be males than were GED students ($p<.001$). No differences between groups were found in reading, math, behavior problems, or special education placement. Prisoners were significantly more likely to have been suspended from school ($p<.001$); their incidence of expulsion was higher than the GED students, but not significantly so. Correlations approaching significance were also found for drug problems ($p=.08$) and alcohol abuse ($p=.06$). The two groups were also compared on the derived problem component scores. For four of these scores, differences between prisoner and GED means were negligible, but prisoners were more likely to have used drugs or alcohol, have had behavior problems, or have been suspended, and the difference is highly significant ($P<.001$). Comparisons between groups were also made regarding the ADHD-related variables. In all areas (inattention, impulsivity, overactivity, and total score), the prisoners' mean scores were slightly lower than GED students'!

Despite the large body of ambiguous findings in research previously cited, one might still cling to the notion that violent criminals suffer from ADHD-related symptoms to a greater degree than do others. To this end, means were calculated for 3 groups: those incarcerated for violent crime (against persons), those jailed for non-

violent crime (against property), and non-criminals (the GED students). Results are illustrated in Table 2.

Table 2

Comparison of Mean Total Scores of Criminals and Comparison Group

| Group | Number in Group | Mean |
|----------------------|-----------------|--------|
| Violent Criminal | 5 | 130.00 |
| Non-violent Criminal | 23 | 156.13 |
| Non-criminal | 17 | 159.41 |

According to these means, the group of violent criminals yielded a mean total score not only considerably lower (although not significantly so) than their non-violent counterparts, but the GED comparison group as well. Such findings would tend to strengthen the viewpoint that criminals are in good control of their impulses and actions, as stated by Heilbrun, Knopf, and Bruner (1976), Overholser and Beck (1986), and particularly Saunders, Repucci, and Saratta (1973), who likewise found delinquents lower in impulsivity than normal subjects.

CHAPTER 3

Discussion of Q-technique Analyses

Regarding Q-methodology, a Q-type Principal Components Analysis was performed, assigning each of the 45 subjects to groups based on factor loadings. A total of 16 groups having Eigenvalues greater than 1 emerged. These accounted for 75.9% of variance among subjects. However, it must be noted that many of these factors were accounted for by only one or two individuals. One factor alone accounted for 23% of variance, using a scree analysis; analysis indicated there may be only 3 useful factors, these accounting for 36.9% of total variance. Nevertheless, given the freedom by Q-technique to examine similarities and differences, it is possible to examine the many small groups for whatever useful information may be gleaned.

One group contains 23 of the 45 subjects. Mean scores for this group were slightly below means for the entire sample in all 4 areas (inattention, impulsivity, overactivity, and total score). Scores showed a substantial range; total score, for example, ranged from 72-169. The mean of the sums of checked problems was also considerably lower than that of the entire sample. Therefore, it is reasonable to assume that a high degree of similarity exists in the pattern of responses. That is to

say, the group answered certain items low and certain items high in a somewhat defined pattern. The ratio of prisoners to GED students is 13:10. This group, then, represents a middle ground of moderate scores.

The second largest group consists of 5 subjects with means moderately above sample means in each of the 4 areas (group mean, total score = 164.200; sample mean, total score = 133.44). It is comprised of two prisoners and three GEDs; the prisoners are males, the GEDs females. Ages range from 24-69, total scores from 133 - 205. Four had been retained, four reported math problems, two had reading difficulty, and both prisoners had been suspended and expelled. All in this group dropped out of school. While one had reached grade 11, another attended only to the fifth grade, the others leaving in the middle school years. This group would appear to be substantially affected by their ADHD-related deficits, particularly in an educational context. Reading and math difficulties may have frustrated these subjects and, while not causing minor behavior problems, led them to either "blow up" or simply give up.

A grouping of two prisoners has mean scores near sample means for inattention, impulsivity, and total score, but for overactivity, this group's mean is considerably lower. One man had been in a psychiatric hospital, the other is incarcerated for sniffing glue. It might be

suspected that the mental health problems of these people contributed to their lowered activity level.

A prisoner who comprises a "group" of one according to the Q-type factor analysis is an unusual case. This 26 year old male, convicted of burglary and possession of marijuana, scored high on overactivity, very high for inattention and total score (169.00 compared to sample mean 133.444). He checked 10 problems on the checklist compared to a 2.978 mean for the sample; he reached the eighth grade, had been retained twice, and received special education including placement in a special school. Every problem on the checklist was marked except two: reading difficulty and math difficulty. It appears that this man, who has been in a psychiatric hospital twice, suffers from severe emotional problems but may not be educationally impaired by his ADHD-related symptoms. Did the emotional problems cause the ADHD symptoms? Did the ADHD symptoms contribute to the emotional problems? While such questions are impossible to answer here, it may be said that the combination of the two problems has been responsible for this man's failures, both in school and society. His affinity for marijuana is also understandable, given the relaxing qualities of the drug.

Another "group" of one provides an interesting contrast to the above subject. Also a prisoner (convicted of theft, forgery, and DUI), this man's total score of 71

was the lowest of any respondent. Additionally, he checked only one problem area, alcohol. This man's seemingly cerebral nature (his score for overactivity was more than two standard deviations below the sample mean) seems well suited to his crime of forgery, an act which might well be carefully premeditated. His occupation before incarceration is also interesting: he was a bricklayer.

A 37 year old male and a 44 year old female prisoner comprise another group with an unusual pattern of responses. Their mean scores for inattention, impulsivity, and total score were well below sample means, yet they scored high on the overactivity component. Both were convicted of theft. Could overactivity be a causal factor of such a crime? A check of the overactivity scores of the other thieves in the sample shows no discernible similarities. A different, single-subject grouping contains a man convicted of theft whose only high score was for impulsivity, while yet another single-subject group includes a convicted thief with high scores on all variables.

The respondent with the highest total score (210) was also highest for inattention, tied for the highest score for overactivity, and was second highest in impulsivity. Three problem areas were checked. Interestingly, this person is a 22 year old female GED student with no reported behavior, substance abuse, or legal problems; rather, her

only difficulties were in reading and math, and she was retained once. Despite her considerable deficits, she never received special education. It is speculated that she was passed quietly through the system because her lack of behavior problems made her "invisible." In other words, this person's needs may not have been met because she was too well behaved. Only two other subjects showed total scores even close to that magnitude, one at 205, another at 202. Contrary to what might have been predicted, both were female and both were GED students. One had been retained twice but reported only math difficulties, not reading or behavior problems (which would seem more likely). The other had no reading or math problems, but she did have behavior problems serious enough to cause expulsion, which she reported as due to alcohol and drugs. She had also been in a psychiatric hospital for alcohol and drug addiction.

These three women, all in their twenties and severely afflicted with ADHD symptoms, reflect the diversity of the disorder's effects. Educational potential is obviously delimited, behavioral and/or emotional problems may be encountered. The problem, even if serious, may not be diagnosed if the afflicted person does not misbehave as a child.

It is instructive to examine the characteristics of each of the violent offenders, despite the fact that their

scoring patterns bore little similarity; problems noted on the checklist did indicate many similarities. Four of the five were suspended from school while none had been retained, and 4 of 5 are males. The first and last of these observations are not surprising, but one might expect that violent criminals had had learning problems serious enough to cause them to be retained. Also, only one had been expelled. Three of those who had been suspended indicated that they had been so more than 5 times. Interestingly, only one indicated previous history of fights and violence, and just one had difficulty with alcohol. This person and one other reported a problem with drugs. These findings are also unexpected, since violence is so often equated with drugs and alcohol by the media. One had received special education services, but only one had completed high school at the time the questionnaire was completed (one passed the GED exam afterward). Only 2 of the violent offenders indicated behavior problems; this finding is interesting, since 4 had been suspended! This last finding highlights a weakness of self-report methods in general and this research in particular: they rely on the truthfulness of the subjects. Are we assuming honesty in the responses of dishonest people? Undeniably, we are.

CHAPTER 4

Conclusions

Regardless of the difficulties in predicting behavior of any kind and criminal behavior in particular, psychology has been and will continue to be under pressure to try to do so. This pressure comes from the judicial system, which must decide if a person should be incarcerated, kept incarcerated, or allowed to live freely and make his/her own decisions. The public also places these demands in the hands of psychology, and justifiably so: after all, who should understand human behavior better than psychologists?

Unfortunately, these demands are far from being met, due in large part to the complexities of the human mind and the uniqueness of individual experience. Monahan (1981) noted that most studies indicate poor ability to predict violence for several reasons: violence is vastly overpredicted by clinicians; a low base rate makes prediction difficult, since even very violent people behave that way only a minuscule percentage of the time. He concluded that the only worthwhile predictor of future violence is past violence. Perhaps we must acknowledge that this challenge may never be met, and take consolation in the fact that, to paraphrase Socrates, we know nothing except the fact of our ignorance.

The results of this endeavor lend credence to the conflicting nature of existent research, since few distinct patterns emerge regarding ADHD-related problems among these susceptible subjects. However, the absence of clear patterns is instructive in itself, demonstrating that we must be careful in making assumptions as to who is likely to be afflicted. This study indicates that those incarcerated may exhibit some symptoms of ADHD to a greater extent than the comparison group, but overall, prisoners show lower scores than the comparison group. Also, severity of symptoms does not necessarily increase with severity of crime (degree of violence).

Perhaps the most surprising finding here is the fact that the 3 highest scorers were females and that none of them were incarcerated. This serves to illustrate the point that assumptions must be made carefully, since the expectation was that prisoners and males would score higher than their counterparts.

As for the questionnaire, it appears to be a reliable measure of that which it seeks to find, the existence of adult ADHD-related symptoms. The attempt to break the disorder into its component parts is less successful, however. This may owe as much to our lack of knowledge about ADHD as to inadequacies in the test. While overactivity initially was considered the hallmark symptom, some now discount its importance (Thorpe & Olson, 1992);

some now consider impulsivity to be of primary importance (Milich & Kramer, 1984).

Thus, it is concluded that the characteristics which are measured by this test do not appear to be predictive of criminality. It may be said, however, that criminals seem to have more difficulty in certain problem areas than did the comparison group. This leaves open the possibility that factors exist which might predict criminality; they have yet to be determined.

REFERENCES

References

- American Psychiatric Association (1987). Diagnostic and statistical manual of mental disorders (3rd ed. Revised). Washington, D.C.: Author.
- Borland, B. L., & Heckmann H. K. (1976). Hyperactive boys and their brothers: A 25-year follow-up study. Archives of General Psychiatry, 33, 669-675.
- Brennan, P. A. & Mednick, S. A. (1990). Psychopathology as a predictor of violent criminal behavior. Paper presented at the annual convention of the American Psychological Association, Boston, MA.
- Carr, S. C. (1992, January). The use and interpretation of Q-technique factor analysis. Paper presented at the annual meeting of the Southwest Educational Research Association, Houston, TX.
- Cornell, D. G., (1987, March). Clinical assessment of the violent adolescent. Paper presented at the annual meeting of the National Association of School Psychologists, New Orleans, LA.
- Erez, E. (1980). Planning of crime and the criminal career: Official and hidden offenses. The Journal of Criminal Law and Criminology, 71(1), 73-76.
- Farrington, D. P. (1990). Implications of criminal career research for the prevention of offending. Journal of Adolescence, 13, 93-113.
- Farrington, D. P. & West, D. J. (1990). The Cambridge study in delinquent development: A long-term follow-up of 411 London males. In H.J. Kerner & G. Kaiser (Eds.) Criminality: Personality, behavior, life history. Heidelberg, Germany: Springer-Verlag.
- Gough, H. G., & Peterson, D. R. (1952). The identification and measurement of predispositional factors in crime and delinquency. Journal of Consulting Psychology, 16, 207-212.
- Heilbrun, A. B., (1979). Psychopathy and Violent Crime. Journal of Consulting and Clinical Psychology, 47(3), 509-516.

- Heilbrun, A. B., Knopf, I. J., & Bruner, P. (1976). Criminal impulsivity and violence and subsequent parole outcome. British Journal of Criminology, 16, 367-377.
- Hunt, R. (1984). Residual attention deficit disorder inventory. Unpublished manuscript.
- Jutai, J. Hare, R. D., & Connolly, J. (1987). Psychopathy and event-related potentials (ERPs associated with attention to speech stimuli. Personality and Individual Differences, 8, 175-184.
- Kelley, C. M. (1972). Crime in the United States: Uniform crime reports. Washington, D.C.: Federal Bureau of Investigation.
- Kozol, H., Boucher, R., & Garofolo, R. (1972). The diagnosis and treatment of dangerousness. Crime and Delinquency, 18, 371-392.
- Levy, S., Southcombe, R. H., Cranor, J. R., & Freeman, R. A. (1950). The outstanding personality factors among the population of a state penitentiary: A preliminary report. Journal of Clinical and Experimental Psychopathology, 13(2), 117-130.
- Loney, J., Whaley-Klahn, M. A., Kosier, T., & Conboy, J. (1981, November). Hyperactive boys and their brothers at 21: Predictors of aggressive and antisocial outcomes. Paper presented at meeting of the Society for Life History Research, Monterey, CA.
- Menkes, M., Rowe, J. S., & Menkes, J. H. (1987). A 25 year follow-up study on the hyperactive child with minimal brain dysfunction. Pediatrics, 39, 393-399.
- Magnusson, D., & Torestad, B. (1993). A holistic view of personality: A model revisited. Annual Review of Psychology, 44, 427-52.
- Monahan, J. (1981). Predicting violent behavior. New York: Sage.
- Monahan, J. (1975). Violence and criminal justice. In D. Chappell & J. Monahan (Eds.) Violence and criminal justice (pp. 33-68). Lexington, MA: Lexington Books (D.C. Heath).
- Moskowitz, D. S., Schwartzmann, A. E., & Ledingham, J. E. (1985). Stability and change in aggression and withdrawal in middle childhood and early adolescence. Journal of Abnormal Psychology, 94, 30-41.

- Oas, P. (1985). Impulsivity and delinquent behavior among incarcerated adolescents. Journal of Clinical Psychology, 41(3), 422-423.
- Olweus, D. (1979). Stability of aggressive reaction patterns in males: a review. Psychological Bulletin, 86, 852-875.
- Overholser, J. C., & Beck, S. (1986). Multi-method assessment of rapists, child molesters, and three control groups on behavioral and psychological measures. Journal of Consulting and Clinical Psychology, 54(5), 682-687.
- Raine, A., & Duncan, J. J. (1990). The genetic and psychophysiological basis of antisocial behavior: Implications for counseling and therapy. Journal of Counseling and Development, 68, 637-644.
- Raine, A. & Venable, P. H. (1987). Contingent negative variation, P3-evoked potentials and antisocial behavior. Psychophysiology, 24, 175-184.
- Rapoport, J. L., & Ferguson, H. B. (1981). Biological Validation of the hyperkinetic syndrome. Developmental Medicine and Child Neurology, 23, 667-682.
- Satterfield, J. H., Cantwell, D. P., Saul, R. E., & Usin, A. (1974). Intelligence, academic achievement, and EEG abnormalities in hyperactive children. American Journal of Psychiatry, 133, 391-395.
- Saunders, J. T., Repucci, N. D., & Sarata, B. P. V. (1973). An examination of impulsivity as a trait characterizing delinquent youth. American Journal of Orthopsychiatry, 43(5), 789-795.
- Schmauck, F. J. (1970). Punishment, arousal, and avoidance learning in sociopaths. Journal of Abnormal Psychology, 76, 325-335.
- Schuessler, K., & Cressey, D. (1950). Personality Characteristics of criminals. American Journal of Sociology, 55, 476-484.
- Stanton, J. M. (1969). Murderers on parole. Crime and Delinquency, 15, 149-155.
- Stephenson, (1953). The study of behavior. Chicago: University of Chicago Press.

Thorpe, G. L. & Olson, S. L. (1992). Behavior therapy.
Boston: Allyn and Bacon.

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

Weiss, G., Hechtman, L. H., & Perlmann, T. (1978).
Hyperactives a young adults: School, employer, and self-
rating scales obtained during 10 year follow-up
evaluation. American Journal of Orthopsychiatry, 48,
438-445.

Weitan, W. (1992). Psychology, themes and variations.
Pacific Grove, CA: Brooks/Cole.