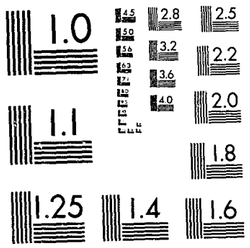

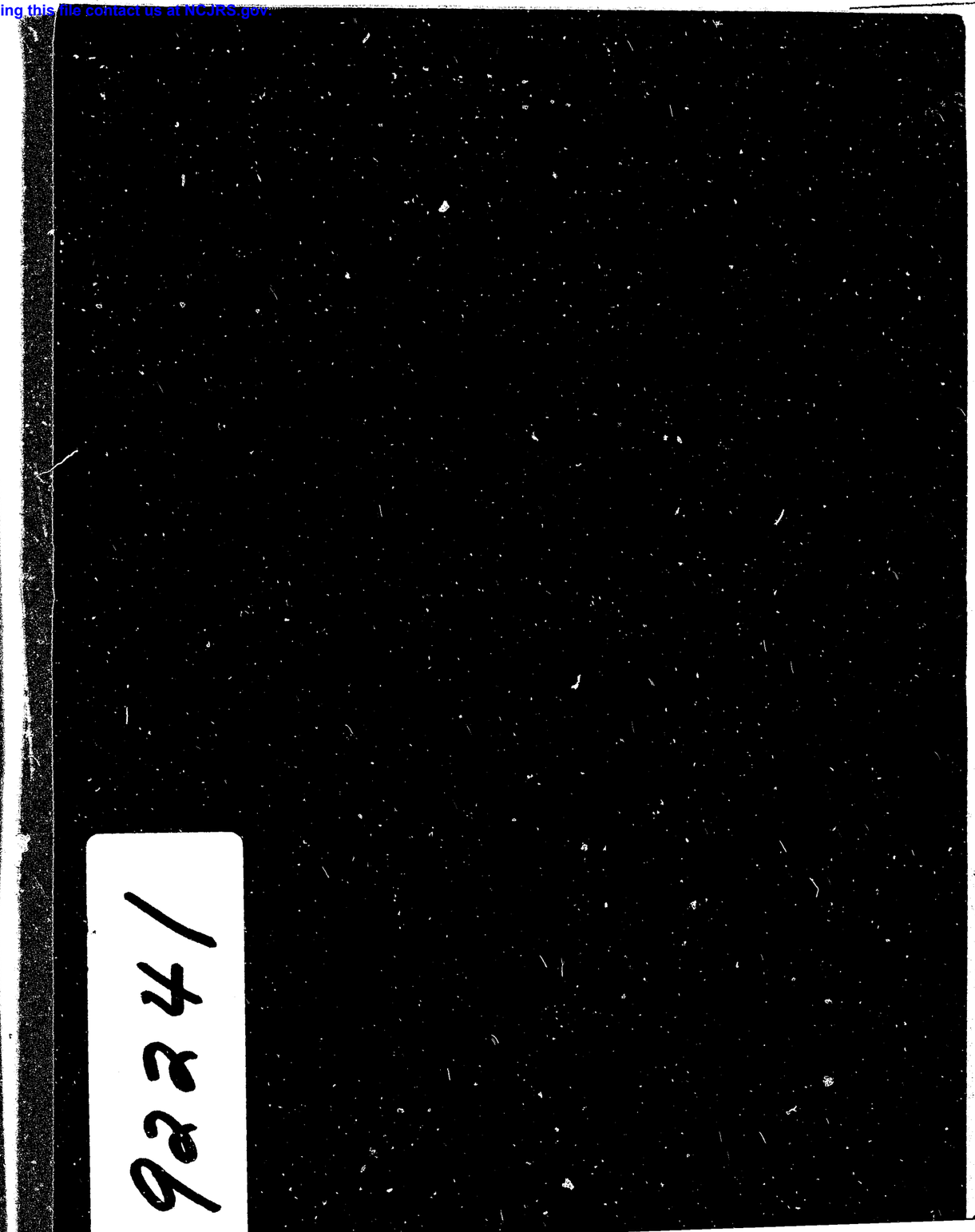

THE COGNITIVE MODEL OF CRIME AND DELINQUENCY PREVENTION AND REHABILITATION:

I. ASSESSMENT PROCEDURES

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FOREWORD

This report is the result of a long-term collaboration between Dr. Ross and his colleagues, and this Ministry. The issue of modifying the behaviour of offenders has been a pressing problem throughout the decade of the seventies. At times, this issue flared into heated debate. Rather than enter into the emotional, albeit fruitless, exchange on either side of "the nothing works" debate, a more temperate approach was chosen. We were convinced that both sides of the argument had some merits. We were equally convinced that, in the heat of debate, the wrong questions were being discussed. From our perspective, the train of reasoning should have evolved along the line of:

a) if something does not appear to work, then why is this the case;

b) if something does appear to work, then what is the critical component that makes it work.

These questions have occupied much of our efforts since the mid-seventies. Dr. Ross and his colleagues have been prolific in their examination of the issues. Out of those various efforts emerged what is now called the Cognitive Model of Crime and Delinquency Prevention and Rehabilitation.

Currently, the Ministry is sponsoring Dr. Ross in further elaborations of the methodology of intervention. Our goals is to enter into a clinical trial in 1983/84. Further reports documenting the progress of these efforts will be forthcoming at the appropriate stages of development.

Caution is urged not to view our efforts as the naissance of another panacea. The target group has been tightly defined, and the intervention strategies are being carefully tailored to suit that group. It is not perceived that all correctional clients will need, or benefit from these interventions.

Given the long history and the voluminous nature of this work, no one monograph serves as a full compendium of the cognitive model. Bob Ross and Liz Fabiano plan to produce, in the near future, a book that will serve this purpose. For interested readers, the proposed title of this book is "Straight Thinking": The Cognitive Model of Crime and Delinquency Prevention and Rehabilitation.

One final comment is required. The cognitive model is just that, a model. Ultimately, the validity of a model is an empirical question. Much time, effort and resources will be required to establish the validity and the limiting factors of this particular model. Nonetheless, the model is though provoking.

A.C. Birkenmayer
July, 1983.

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Andy Birkenmayer stimulated our initial interest in examining the cognitive functioning of offenders. We appreciate his advice and his unfailing encouragement of our research.

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I

INTRODUCTION

The cognitive model of crime and delinquency holds that criminal behaviour is associated with cognitive deficits - that many offenders have had developmental delays in the acquisition of a number of cognitive skills which are essential to social adaptation (Ross & Fabiano, 1981). Their cognitive deficits place them at risk for a criminal adjustment. The model provides a reconceptualization of criminal behaviour, which has value not only in terms of explaining criminal behaviour, but also in terms of crime and delinquency prevention and offender rehabilitation. It suggests that the rehabilitation of a substantial number of offenders could be achieved by correctional programs which focus on remediating such deficits through a variety of cognitive training techniques.

Support for the cognitive model is found in two areas: (1) research which has demonstrated that many offenders evidence deficits in one or more specific cognitive skills (Ross & Fabiano, 1981); (2) research which has demonstrated that a common and perhaps essential component of effective correctional programs is an intervention strategy which leads to the offenders' cognitive development (Ross & Fabiano, 1982).

Although there is considerable support for the cognitive model, its refinement and development requires further research. Many, but not all offenders have cognitive deficits. Accordingly, it is essential that studies of

specific sub-groups of offenders be conducted in order to determine which types of offenders are most likely to evidence such deficits. In order to determine the value of cognitive assessment for predicting criminal behaviour, studies of the relationship between cognitive functioning, criminal history, and recidivism are needed. Moreover, the rehabilitative potential of the cognitive model should be further evaluated in well-designed experimental studies which examine the effectiveness of various cognitive training techniques on cognitive development, social adjustment, and recidivism. The present report addresses an issue which is crucial to all of the foregoing research: the establishment of standard objective procedures for assessing cognitive functioning in offenders.

Studies demonstrating a relationship between cognition and crime have examined a remarkable variety of cognitive functions, ranging from basic perception to complex problem-solving. In so doing, they have employed an equally wide variety of different tests and measures. To some extent this reflects the fact that a considerable number of cognitive deficits may be prevalent among offenders. However, it also reflects the fact that most investigators have been working independently without attempting to assess the relationship between their findings and those of others. Each selects his favourite test to assess offenders on the particular cognitive function which is of interest to him, without examining how the function or the test he is concerned with relates to the function or test that other investigators have been examining.

It is not known how (or whether) the different measures relate to one another, whether they are actually measuring different cognitive functions, or whether the different tests are actually measuring the same thing. At this point in the development of the model, it is not clear whether the various cognitive deficits represent deficits in independent cognitive skills or whether they relate to the same basic general cognitive factor. Sub-groups of offenders may have deficits in different functions, or they may share in common a more general cognitive deficit. Information on this issue is clearly crucial if intervention programs are to be directed to the appropriate targets. Unless there is a generalized cognitive deficit, there seems to be little advantage (and considerable waste) in providing general cognitive training for an offender who really requires training only in a specific cognitive skill.

As an initial step in addressing the foregoing issues, a review was conducted of the literature on cognitive assessment. The major aim of the review was to determine which assessment devices appear to be most valuable for offender populations and to select a battery of measures which, following appropriate psychometric work, could be used both as a standardized research instrument and as an assessment/screening device for individual offenders.

II

COGNITIVE ASSESSMENT: GENERAL CONSIDERATIONS

How one assesses cognition depends upon a number of factors:

CAPACITY VS. CONTENT

A markedly different approach to cognitive assessment is required if one wishes to examine the content of an individual's thoughts (what an individual thinks) than if one wishes to assess the individual's cognitive ability (how or how well he thinks).

In general, the strongest evidence of a cognition/crime link derives from studies of offenders' cognitive ability rather than the content of their cognition. Very few adequately designed studies have systematically explored the content of cognition in offender populations. Research with offenders indicates that their cognitive deficits are not simply inappropriate thoughts that they evidence in particular situations, but a more pervasive lack of cognitive skills. It is not merely what they think that is amiss but how well they are able to think. Accordingly, teaching them what to think in a specific problem situation will not suffice. They need to develop their general cognitive skills. This must be reflected in assessment which should emphasize measurement of cognitive abilities.

At the same time, one must be mindful of the fact that how well the offender can think is an important determinant of what he will think, and what he thinks is a critical determinant of what he does. Extensive research on the con-

of the cognitive model. We have kept this in mind in recommending assessment procedures and strongly suggest that cognitive assessment both in criminological research and correctional practice include not only measures of how well offenders can think but procedures to enable examination of the content of their thinking.

ABILITY VS. PERFORMANCE

How one decides to assess cognition also depends on whether the purpose of assessment is to determine how much cognitive ability an individual has (his capacity) or to determine the extent to which he is likely to apply his ability in his everyday life (his performance). An individual may have a well developed ability for critical thinking or other cognitive functions but, for whatever reason, may seldom utilize his skills in daily problem solving.

Research on the cognitive functioning of offenders suggests that their problem is not that they simply do not practice good reasoning. Rather, it appears that they have not developed cognitive skills which they could practice, even if they chose to do so. Accordingly, cognitive assessment procedures should be designed to measure ability rather than general tendency.

IMPERSONAL VS. INTERPERSONAL

In considering how to assess cognition in offenders, it is essential to emphasize the distinction between two different aspects of cognition: impersonal and interpersonal.

> "In the physical (impersonal) realm, where the primary interest is understanding the development of concepts about the physical world, cognition is that facet of thinking

> and space. However, in the social (interpersonal) realm, where the primary interest is understanding people and their interactions, cognition refers to that facet of thinking and perception which allows one to make inferences about others, to take the perspective of another, to understand the perceptions others have of oneself, and to understand social customs, rules, and regulations". (Ross & Fabiano, 1981, p.7).

The relationship between cognitive functioning on impersonal tasks and on interpersonal tasks has not been determined. We cannot assume that impersonal and interpersonal cognitive tasks tap the same cognitive functions. Individuals who perform well on impersonal tasks may fare badly in solving problems in the social sphere.

As we have noted elsewhere (Ross & Fabiano, 1981), there are similarities between the deficiencies in social cognition which may engender criminal behaviour and deficiencies in the impersonal domain such as the following which may be evidenced by some offenders:

> "Often, thinking is impaired because people have not taken in relevant information. Their perception may be blurred, or sweeping. They may be impulsive, and seize on part of the picture. They may not be able to categorize events under appropriate headings ... They may be imprecise in the gathering of data. They may lack the capacity to use information from two or more sources simultaneously, or to see organized data as a unit.
>
> ... They may be unable to select relevant clues from irrelevant ones in problem definition. They may not pursue logical evidence, or be unable to test hypotheses. They may be unable to plan; or they may not be able to use verbal concepts even though they apparently understand them when they hear others using them". (Griffin, 1981, pp. 3-4).

Research which has found evidence of cognitive deficits in offenders consists primarily of studies of their cognitive abilities in the interpersonal sphere. There is far less (and far less convincing) evidence that offenders have deficits in impersonal cognitive functioning. However, in recommending assessment procedures, we have included some measures of impersonal cognition which we feel should be used, particularly for research purposes. If criminal behaviour is associated with cognitive deficits in the impersonal domain, it would seem reasonable to assume that educational programs should stress training in these tasks and not only training in social cognition.

COGNITIVE LEVEL

How one assesses cognition will also depend on what cognitive function or level of functioning one is interested in. One can assume that there is a continuum of levels extending from basic perception, learning, and memory, to higher-order reasoning and complex problem-solving. Different tests are required for each level, ranging from simple psychomotor tasks of basic perception to complex tests involving, for example, syllogisms or analogies which might tap the individual's ability in abstract reasoning.

We have deliberately excluded from the assessment measures we recommend for offenders a large number of tests of basic perceptual-motor skills which measure functions which have been thought to be deficient in offenders. Whereas such tests measure important aspects of cognitive functioning,

they do so at the most elementary level and their relation to higher cognitive functioning (particularly socio-cognitive functioning) is unclear. Moreover, evidence that offenders perform poorly on such measures is not convincing (Ross, 1977). We decided to include only those measures whose use can be supported by research, and/or those which appear to be highly promising from a theoretical point of view.

III

APPROACHES TO ASSESSMENT

DIRECT ASSESSMENT

Innumerable procedures and instruments have been used to study cognitive functioning in the general population. There is a virtual plethora of tests and techniques including interviews, self-report scales, psychometric tests, projective tests, self-report inventories and scales, think aloud techniques, thought-sampling techniques, thought-listing procedures, and measures of free association and of spontaneous private speech. Determining which of these might be most useful for assessing cognitive functioning in offender populations is a formidable task.

In general, there are two ways to assess cognitive functioning: (1) direct: ask the subject to report what he is thinking. (2) indirect: infer the subject's cognitive functioning from his behaviour or from his performance on a test.

The most direct way to find out what a person thinks is simply to ask him. A number of assessment techniques which rely on direct self-reports can be utilized. For example, cognitive therapists frequently ask their clients to report the thoughts that precede, accompany, or follow their maladaptive behaviour. Such inquiries often reveal distortions or errors in their client's thinking such as overgeneralizing (e.g. taking a single untoward event as proof of one's total incompetence; exclusion (disregarding an important factor or event); catastrophizing (exaggerating the significance of an

event without adequately assessing its impact); or arbitrary inference (reaching a conclusion with insufficient evidence). Asking the client to self-report may be a rich source of information about the individual's cognitive functioning.

Similarly, one could ask offenders to describe the thoughts they had before, during, and after a criminal act or any other problematic behaviour. The interview might include imagery techniques. For example, the offender may be asked to "run a movie", i.e. to close his eyes and imagine a particular situation (e.g. a peer suggesting that they participate in some illegal activity) and to describe what is going on - what he is thinking, what he is saying to himself, what is provoking him, how (or whether) he is evaluating the consequences of his actions and what actions he is actually considering. The offender may be asked to do some homework, for example, to keep a "cognitive diary" of his thinking. He may be asked to self-monitor, record or even graph his thinking, problem-solving, and decision-making. Schwartz & Gottman (1976) have described a technique in which the subject is shown a videotape of his behaviour and asked to report what he was thinking at various points. Alternatively, one can have the client role-play a problem situation and ask him to report his thoughts. The offender might be asked to participate with a group of others who have been engaged in some problem-solving task and have been asked what they were thinking while doing it. The group dynamic may help the individual offender to recognize, identify, and express his thoughts.

Self-report inventories which ask the subject to indicate which problem-solving strategies are characteristic of him have recently been developed and may be of value in work with offenders (e.g. Heppner & Petersen, 1978). Finally, it should be noted that it may be possible to manipulate the interview situation so as to determine how the offender functions cognitively under stressful conditions or conditions which simulate those which have previously stimulated him to behave in an anti-social manner.

The shortcomings of interview and self-report data are well known. Doubts have been expressed about the veracity of the individual's self-report and about the individual's ability to assess himself accurately. Individuals may distort their self-reports defensively in order to present themselves in the most favourable light. However, as Mischel's (1981) research has demonstrated, when they are asked the right questions, people can be excellent predictors of their own behaviour.

> "The predictions possible from a person's own simple direct self-ratings and self-reports generally have not been exceeded by those obtained from more indirect, costly, and sophisticated personality tests, from combined test batteries, and from expert clinical judges". (Mischel, 1981, p.481).

In spite of reservations about the reliability of self-report data, it is considered essential to the development of the cognitive model that investigators and practitioners in their study of offenders' thinking not restrict themselves to psychometric tests which might be thought to be more objective than self-report approaches.

Interviews and inventories may, in fact, represent the only means of tapping some of the most important aspects of the offender's cognitive processes.

INDIRECT ASSESSMENT

It is essential to the development of the cognitive model of crime and delinquency that further research using direct measures be conducted on what offenders think. It is perhaps, more important at this time to refine our knowledge of the offender's cognitive abilities. It is essential for the latter research that a battery of tests be developed which could provide a standard and objective system for assessing offenders.

In order to develop such a battery, we critically examined the literature on cognitive tests. This represented a considerable undertaking. The investigator examining the literature on tests of cognition is likely to feel that the number of available tests is infinite. There is no single source of such material. Although many tests of cognition are listed and evaluated in compendiums such as Buros' Mental Measurements Yearbooks, most of these are designed to measure cognitive functions which have not been studied in offender populations. Most of these measures were designed for children or college students and are inappropriate for use with adolescent or adult offenders. Furthermore, most of the cognitive tests which have been used with offenders are not reviewed in Buros' publications. Typically, the tests which

have been used have been developed for research purposes rather than for clinical application. Many are described only in professional journals, government reports, theses, and unpublished research documents and are neither widely used nor commercially distributed.

In developing the battery of tests, we have been highly selective. Our selection was determined by our views as to the likelihood that a test would be useful and appropriate for offender populations.

In our search of the literature, we examined a large number of tests which appeared to measure important aspects of cognitive functioning. An initial screening weeded out those which had limited relevance to the functions which had been identified as problematic for offenders. A second screening weeded out those which were found to be inadequate in terms of psychometric properties, or had restricted availability, or would be impractical to use with offenders. Many had to be rejected because they required too high a verbal or educational level; others because they were not adequately standardized; and others because data on their validity and reliability were inadequate or unavailable. A list of the tests rejected in the second screening is provided in Appendix. 2.

We have not included projective techniques, although they may be among the richest sources of information about the individual's cognitive functioning. Our concern has been for the establishment of a standard battery of tests which can be administered and scored easily and objectively.

We have included in the recommended battery very few tests which have been designed for use in schools as measures of those cognitive functions considered important as indicants of academic aptitude. However, in view of the relationship between educational achievement and delinquency, it is important to investigate the performance of offenders on such tests. It should be noted that such tests yield very little information on socio-cognitive ability, but appraise cognitive functions requisite to scholastic performance. The relationship between these two areas has not yet been determined. It should be.

It would be highly advantageous if, rather than a battery of tests, one single measure of cognitive functioning could be recommended. Unfortunately, because of the diversity of functions involved and the limited amount of knowledge about the relationships between these functions, no single test can be recommended at present. There are some tests which do tap a variety of cognitive functions but none which appear to be adequate for the present purposes. Moreover, none of the multi-function cognitive tests measure interpersonal cognitive functioning. We assumed that using a multi-facetted approach for the assessment of offenders is just as important as using a multi-facetted program for their rehabilitation.

We selected a combination of tests which appear to tap all of the cognitive functions which research has indicated may be problematic for offenders:

- . self-control (vs. impulsivity)
- . field-independence (vs. field-dependence)
- . abstract reasoning (vs. concrete thinking)
- . locus of control (internal vs. external)
- . social perspective-taking (vs. egocentric thinking)
- . interpersonal cognitive problem-solving

We have also included tests for three functions which have not been extensively studied among offenders, but are important areas for research:

- . cognitive flexibility (vs. rigidity)
- . empathy
- . critical thinking

Our selection should not be taken to imply that these are independent functions or that offenders have no problems in other cognitive areas.

The test battery we recommend includes one test which we judge best for each of the cognitive functions. However, for each function we have suggested some alternative measures. These are presented in Appendix 1. Also described in Appendix I, are a number of other tests which more or less adequately measure these cognitive functions. Moreover, Appendix 1 includes some tests which have been widely used in assessing cognitive functioning in offenders but have important shortcomings, either in terms of psychometric properties or in terms of their relevance to the cognitive model. Finally, Appendix 1 includes some tests which appear to have reasonable promise for cognitive research for offenders, but have not as yet been extensively applied in criminological research.

The researcher or practitioner will likely wish to select from the recommended battery of tests the test or combination of tests which particularly suit his interests. As a general test battery, the collection would be too time-consuming to be used in its entirety. However, we feel that with judicious selection of tests or parts of tests and appropriate psychometric work, a practical battery of tests can be derived which would provide a thorough appraisal of the offender's functioning on those cognitive skills which have been found to be associated with criminal behaviour.

In using the following tests and interpreting their results, it is important to bear several facts in mind:

1. Test-Taking Deficits: It is important to differentiate between what the offender does on the test and what he can do (his capability). Particularly in investigating differences between offenders and non-offenders, it is necessary to differentiate a cognitive deficit from a test-taking deficit. The offender's poor performance may reflect not a lack of ability, but a distaste for tests, boredom, or emotional resistance. Poor scores may reflect the adverse effects of institutionalization or the subject's general expectancy of failure. Low scores may reflect not that he has a cognitive deficit, but that he did not understand the instructions (or did not care to), that he does not want the examiner to know about him, that he wishes to appear incompetent, or that he is simply indifferent.

2. Sampling: A test provides only a limited, although hopefully representative sample of the offender's behaviour. An offender may function well in the test situation and function badly in other situations, for example, when under stress or peer pressure. As we noted earlier, he may have ability but, for various reasons, not apply it. Cognitive tests yield information only on what the offender can do and not on what he usually does (as personality tests attempt to do). However, Mischel's (1981) research has concluded that cognitive, as opposed to personality assessment, yields good cross-situational and temporal stability.

3. Holistic Assessment: In using psychological tests to assess cognitive functioning, the investigator must remain aware of the necessity of supplementing the tests with other strategies to find out how and what the offender

thinks (e.g., natural observation, role-playing, interviews, inventories, and case history data). Moreover, he should not only examine the offender's test scores, but should also consider qualitative data such as how he approaches a problem, how he deals with errors, and whether he is systematic or disorganized, impulsive or careful, etc. It should also be stressed that one should not limit one's assessment to measuring cognition. How well one thinks in any situation is determined not only by one's basic cognitive ability but also by environmental, physiological, behavioural, and affective factors. Motives, attitudes and values will also strongly influence how and how well the offender will think in any situation.

4. I.Q. and Crime:

> "We cannot easily measure thinking skill so we ignore it and assume that thinking is but intelligence in action. It is nothing of the sort. Many highly intelligent people are poor thinkers. Many people of average intelligence are skilled thinkers. The power of a car is separate from the way the car is driven". (deBono, 1981, p.10).

It is important to distinguish between general intelligence (as measured by I.Q. tests) and the cognitive functions which are subsumed by the cognitive model. As we have indicated elsewhere (Ross & Fabiano, 1981), the assumption of a relationship between cognitive deficits and criminal behaviour does not require the additional assumption of a relationship between general intelligence and crime, but it is not incompatible with such a relationship. Low correlations have been found between I.Q. and the interpersonal cognitive functions found to be underdeveloped in offenders. A high I.Q. is no guarantee that an offender will be able to perform well in those socio-cognitive tasks which are essential to effective social adaptation. Otherwise bright offenders may be sadly

lacking in problem-solving and other cognitive skills, particularly in the interpersonal sphere. Because an individual has a high I.Q., it does not necessarily follow that his social intelligence will be high. However, it is likely that low general intelligence will limit the offender's acquisition of socio-cognitive skills. For that reason and because of recent studies which have reaffirmed the relationship between I.Q. and crime (Hirschi & Hindelang, 1977), we recommend that an intelligence test be included in a cognitive assessment battery.

5. Learning Disabilities & Crime: The argument for a relationship between cognitive deficits and anti-social behaviour does not require or pre-suppose the assumption of a relationship between anti-social behaviour and learning disabilities. It is, of course, reasonable to hypothesize that the individual who has a perceptual-motor dysfunction or a language process disorder will be handicapped in the development of social cognitive ability and, as a result, may be more likely to engage in criminal activity. However, delays in social cognitive development may occur as a function of factors other than learning disabilities, such as inadequate modelling, limited social learning opportunities, and poor motivation. A relationship between deficient social cognitive functioning and crime does not contraindicate the possibility of a relationship between crime and learning disabilities (however defined), but it is important to note that the cognitive assessment procedures we are recommending are not measures of learning disability.

6. Literacy: Most tests rely on verbal instructions. Caution must be exercised to ensure that the offender understands the instructions and has the requisite verbal skills to comprehend the test materials and tasks.

7. Motivation: To assess cognitive competence, the investigator must create conditions and incentives which will encourage the offender's optimal performance.

Finally, we should note that assessment may not only be useful for gathering information. It may also be therapeutic. As the offender is stimulated by the questions to examine his thoughts, he may begin to recognize (perhaps for the first time) that his thoughts affect his behaviour. He may come to recognize some of the errors that characterize his thinking. He may actually begin to change his views of his behaviour and his world simply as a function of being required to think about them seriously and intently.

V

THE FOURTH "R" TEST BATTERY FOR OFFENDERS

THE FOURTH "R" TEST BATTERY

FOR OFFENDERS

FUNCTION	TEST
Self-Control	Matching Familiar Figures Test
Social Perspective-Taking	Chandler's Role-Taking Task
Concrete-Abstract Reasoning	Kahn Test of Symbol Arrangement
Interpersonal Cognitive Problem Solving	Means-Ends Problem-Solving Procedure
	Optional Thinking Test
	Awareness of Consequences Test
	Causal Thinking Test
Locus of Control	Levinson's Internal-External Locus of Control Scale
Field Dependence-Independence	Group Embedded Figures Test
Conceptual Rigidity	Gough's Rigidity Scale
Critical Thinking	Watson-Glaser Critical Thinking Appraisal
Empathy/Role-Taking	Hogan's Empathy Scale

1. SELF-CONTROL/IMPULSIVITY:
MATCHING FAMILIAR FIGURES TEST

A considerable number of studies have suggested that a characteristic of many offenders is a lack of self-control, a failure to self-regulate their behaviour, and a tendency to behave impulsively (Ross & Fabiano, 1981). Faced with temptation or a problem situation, many fail to delay their actions, allow themselves time to analyze situations and consider alternative courses of action or to think about the consequences of their behaviour. Rather, they respond in a non-reflective, stereotyped, and inflexible way and do so immediately without any self-regulating thought. One might think that their impulsivity is simply a matter of temperament or a penchant for quick action, but it may be that they have not learned to reflect or to think before they act.

Kagan's Matching Familiar Figures Test (MFFT) has been the most widely used measure of self control-impulsivity. It is a perceptual test designed to measure the individual's style of responding to problem-solving situations in which responding too quickly without adequate reflection leads to errors. The test presents 12 items in which the subject is shown a single picture of a familiar object and is instructed to select from an array of eight variants, the one picture that is identical to the stimulus figure. The test is individually administered. The subject's response latency and

errors constitute his scores on the test. Individuals with short latencies and few errors are judged to be reflective (i.e., slow and accurate) while those who make many errors are judged impulsive (i.e., fast and inaccurate), (Block, Block, & Harrington, 1974).

The MFFT rates highly on ease of administration, interest, construct validity and ease and objectivity of scoring. However, research on its reliability suggest some reservations must be expressed about the use of error scores. A review by Messer (1976) indicates that test-retest correlations for latencies ranged from .58 to .96, but only from .34 to .80 for errors. Internal consistencies for latencies were .89, but only .62 and .58 for errors. Ault, Mitchell and Hartmann (1976) also noted the low reliability of the error scores (.23 - .43 over three-week to 2 1/2 year intervals) and added that, although they were statistically significant, they were below acceptable standards for test-retest reliability. Accordingly, we suggest using latency scores and exercising caution about the use of error scores.

The vast majority of studies using the original version of the MFFT have used elementary-school age subjects (5-12). Newer versions of the MFFT have been developed for use with adults over the age of eighteen. There is still a gap in the test and its construct development in the population of adolescents from 12 to 18 years of age and caution should be exercised in using it with adolescent rather than adult offenders (Shapiro, 1977). It should also be noted that in spite of its extensive use, the MFFT has not been adequately

normed and normative studies with offender populations is required. Finally, we should note not all studies have found offenders to be non-reflective and impulsive, and it is important to determine which sub-groups evidence this characteristic.

Availability: Dept. of Psychology, Harvard University, Cambridge, Mass., U.S.A. 02138.

Other tests which have been used extensively to measure impulsivity in offenders and which may be considered as alternatives to the MFFT are the Porteus Maze Test and Raven's Progressive Matrices. These are discussed in Appendix I.

2. SOCIAL PERSPECTIVE-TAKING: CHANDLER'S ROLE-TAKING TASK

Research has found that many offenders have lags in the development of their social perception. They may lack an ability to take the role of others. They may be caught up in an egocentric conceptual system which restricts them to viewing their environment from a strictly subjective point of view (Ross & Fabiano, 1981). Prosocial behaviour is linked to the development of role-taking or perspective-taking skills and various forms of social deviancy are associated with persistent egocentric thought. Persons demonstrating developmental delays in the acquisition of these skills have been shown to misread societal expectations and to misinterpret the actions and intentions of others. Such persons tend to be judged as callous or indifferent to the needs of other people and they act as though they are, when in fact, they may simply lack an awareness of or a sensitivity to other people's thoughts or feelings (Ross & Fabiano, 1981).

Several studies using a variety of measures have found evidence of role-taking deficits among offenders. However, there is also evidence that not all offenders lack such skills and that cognitive deficiencies may characterize only specific types of offenders - perhaps the most serious or the most persistent ones.

Our review of the literature indicates that the best measure of role-taking for the offender population is Chandler's Role-Taking Task. This test presents cartoon sequences in which a central character is involved in a social situation. His behaviour is explainable in terms of preceding events. Midway into each cartoon sequence a late-arriving bystander is introduced who, unlike the subject, is not aware of the preceding events and, therefore, must interpret the central character's behaviour from another point of view. The subject is asked to tell stories to each cartoon sequence and his responses are scored for the degree to which he is able to set aside facts known only to himself and present a "bystander" story which is different from his own. In effect the subject is rated as to the degree to which his "bystander" story reflects the intrusion of his own privileged knowledge, i.e., the degree of egocentric intrusion.

Of the cognitive role-taking tasks in the literature, the most complete set of reliability data are available for this task (Chandler, Greenspan, & Barenboim, 1974; Kurdek, 1977; Rubin, 1978). Across various studies, interrater reliabilities have ranged from .78 to .96, and short term (2-4 week) test-retest correlations have been around .80. Kurdek (1977) reported a test-retest correlation of .68 after a slightly longer (5-week) period.

Significant correlations have been found between this task and other measures of cognitive perspective-taking (Kurdek, 1977), and teacher's ratings of student's self-control (Zupan & Kendall, 1977). However, conflicting results have been found

(Piche, Michlin, Rubin & Johnson, 1975; Rubin, 1978). For example, Rubin (1978) found low or non-significant correlations with other role-taking measures and concluded that there was little convergent or discriminant validity for role-taking tasks. Correlations between role-taking performance on this task and I.Q. have typically fallen in the range of .2 to .4 across studies (e.g., Chandler, 1973; Rubin, 1978). Studies have demonstrated that this role-taking measure discriminates at a high level between normal controls and chronic delinquent pre-adolescent boys (Chandler, 1973; Little, 1978).

Availability: Not commercially distributed. Source: M.J. Chandler, Department of Psychology, University of British Columbia.

Another test which has frequently been used with offenders is Selman's Test of Social Perspective Taking which is discussed in Appendix I.

3. CONCRETE-ABSTRACT REASONING: KAHN TEST OF SYMBOL ARRANGEMENT

Several studies have indicated that many offenders evidence a concrete rather than an abstract mode of thinking (Ross & Fabiano, 1981). They are less likely than non-offenders to reason about how to respond in social situations, tending to be action-oriented rather than reflective.

There are many tests of abstract reasoning which might be included in the test-battery. Three of these, the Wisconsin Card Sorting Test, the Abstract Reasoning sub-test of the Differential Aptitude Tests, and the Block Design sub-test of the WAIS are discussed in Appendix I. However, we recommend the use of the Kahn Test of Symbol Arrangement. It is the test which has shown the most reliable differences between offenders and non-offenders (Kipper, 1977).

The Kahn Test is comprised of 16 small-sized symbol objects (crosses, hearts, dogs, stars, etc.). The subject is required to arrange these on a special strip five times. Following four of these arrangements, he is asked to give a reason for the chosen placements. Furthermore, in one of the arrangements, the subject is required to state what each object might stand for or symbolize. Altogether, subjects produce at least 24 responses. The responses are evaluated in terms of their appropriateness and their level of abstraction. The categories of evaluation are:

(a) Presenting a bizarre answer

(b) Giving no reason whatsoever

(c) Repeating an answer given previously for a similarly shaped object

(d) Stating the name or the function of the test object

(e) Referring to the shape or appearance of the object

(f) Mentioning the colour of the test object

(x) Giving a concrete association to the test object

(y) Producing a "tangible abstraction" type of a response

(z) Giving an "intangible abstract symbolization" type of response.

A weighted score is assigned to each category. The subject's "symbol pattern", that is, his level of cognitive functioning is determined by both the sum of the weighted scores for the responses and the type of responses elicited most frequently. Elaboration of the scoring and interpretation of the test and supportive evidence of its validity and reliability can be found in Hill & Latham (1965). The reliability of the test for discriminative purposes has been demonstrated in research which has found a predominance of a concrete mode of thinking among offenders (Kipper, 1971, 1977).

Availability: Psychological Test Specialists, Box 1441, Missoula, Montana, U.S.A. 59801.

4. PROBLEM-SOLVING:

A. MEANS-ENDS PROBLEM-SOLVING PROCEDURE (MEPS)
B. OPTIONAL THINKING TEST
C. AWARENESS OF CONSEQUENCES TEST
D. CAUSAL THINKING TEST

An adequate social adjustment requires the ability to cope successfully with problem situations in one's interaction with other people. The individual's ability to cope with such problem situations depends on his skill in a number of specific cognitive functions (Spivack, Platt, & Shure, 1976). These skills include: (1) sensitivity or ability to recognize the potential for problems when people interact; (2) the ability to generate alternative solutions; (3) the ability to consider the consequences of actions both for oneself and others; (4) the ability to conceptualize step-by-step means needed to reach one's goal in the situation and (5) the ability to see the cause and effect relation between one's actions and another's behaviour. Inadequate problem-solving in interpersonal situations has often been found to be associated with behavioural disorders (Ross & Fabiano, 1981). Inferior performance in problem solving has frequently been found among offenders compared with non-offenders. Moreover, individuals with problem-solving deficits have been found to be aggressive and impulsive, and to evidence more anti-social ideas (Ross & Fabiano, 1981).

The deficits noted among offender populations relate to problems in interpersonal problem-solving. As noted above,

interpersonal problem-solving depends on a number of sub-skills. A series of tests of these sub-skills have been developed by Spivack, Platt & Shure (1976). Based on the available research, we recommend including four of these in a battery of tests for offenders. However, we note that available psychometric research is adequate only for the first measure (MEPS). Caution must be exercised in the use of the other three. However, we include them because they appear to measure key aspects of the deficits which have been found in offenders.

A. THE SOCIAL MEANS-ENDS PROBLEM-SOLVING PROCEDURE (MEPS)

This test measures the ability to plan step-by-step means to reach a stated goal in a given situation. The task requires the subject to conceptualize appropriate and effective means of reaching a specified goal in order to satisfy a need in hypothetical interpersonal problem situations.

The MEPS may be either administered by an examiner or self-administered depending upon the education level and reading ability of the subject. In both cases the subject is given the beginning and the end of a number of stories for which he must provide the middle. The stories are each read to the subject once and his response is transcribed verbatim by the examiner directly into the test booklet. Self-administration is effective with subjects at or above the tenth grade level. The subject's entire response to the story is evaluated in terms of the logic and consistency displayed in connecting the beginning with the end of the story. His response is

scored for the number of relevant means, obstacles, enumeration of means, time, irrelevant means, and lack of means as well as for story content.

Several studies indicate that the procedure consistently discriminates groups of individuals (as well as individuals within groups) differing in their levels of demonstrated adjustment (Platt & Spivack, 1972 (a); Platt & Spivack, 1972 (b); Platt & Spivack, 1973; Platt, Spivack, Altman, Altman, and Peizer, 1975). This finding is particularly important in demonstrating the validity of the MEPS. Persons who have actually "failed" in solving the problems of living have been shown to be deficient in conceptualizing the means of solving such problems.

A .98 interrater reliability coefficient has been reported for the total number of means assigned by two raters to each of the nine stories (Platt & Spivack, 1975). The extent to which two independent judges could agree on the number of means, obstacles and notations of time as well as their total score, has also been examined. Interrater agreement has been found to be as high as 91%. Other interrater reliability data were in the .85 to .90 range (Kendall & Hollon, 1981). Adequate predictive validity and concurrent validity has been shown for the MEPS. As indicated by correlations between I.Q. and MEPS scores in various samples, MEPS is not merely another I.Q. test (Kendall & Hollon, 1981).

B. THE OPTIONAL THINKING TEST (ALTERNATIVE THINKING)

The capacity to generate solutions to problems is another component of interpersonal cognitive problem-solving. In order to measure the ability to conceive of alternatives, we recommend the Optional Thinking Test (OT). This test requires the subject to conceptualize options to hypothetical, but typical life problems.

In the Optional Thinking Test, the subject is asked to relate all the things he can think of for a person to do in the given problem situation. A standardized set of probing questions are employed to elicit differing solutions to each problem. Alternatives are scored according to established criteria and techniques which are similar to the scoring of the means-ends stories. Each of the subject's responses for a given story is analyzed relative to the major categories listed.

C. THE AWARENESS OF CONSEQUENCES TEST (TEMPTATION STORIES)

An integral component of a person's interpersonal problem-solving capacity is his ability to consider how his actions may affect himself and other people and how others may react to his behaviour. The process of consequential thinking in interpersonal acts goes beyond simply naming alternative events that may ensue. It includes consideration of the pros and cons of the act and its effects.

Each subject is given four situations in which he is faced with a temptation. The subject is asked to complete the story by indicating the protagonist's thoughts prior to a decision and any subsequent actions. He is then asked to

weigh both the pros and cons of each conflicting choice.

The score for the Awareness of Consequences test reflects (1) the extent to which the subject's responses include references to what might happen if he carried out one or another course of action, and (2) the extent to which he weighs pros and cons of transgressing or not transgressing prior to a decision. In order to enable the scorer to evaluate these aspects of the subject's responses, a series of standard questions are employed and stories are scored on a yes-no basis.

D. THE CAUSAL THINKING TEST

The Causal Thinking Test measures the extent to which an individual spontaneously thinks of cause-and-effect in social situations. The examiner describes a number of interpersonal situations and the subject is asked what the protagonist might be saying to the other characters in the story. Then the examiner, using another probing question, attempts to elicit further story-directed responses from the subject. According to established criteria, responses are analyzed in terms of the degree to which they focus upon the cause of the situation presented.

Availability: The four tests are not commercially distributed. Source: J.J. Platt, Dept. of Mental Health Sciences, Hahnemann Medical College & Hospital, Philadelphia, Pennsylvania, U.S.A.

5. LOCUS OF CONTROL:
LEVINSON'S INTERNAL-EXTERNAL LOCUS OF CONTROL SCALE (I.P. & C. SCALES)

It has often been observed that offenders deny responsibility for their behaviour, tending to explain their actions as being determined or influenced by people or circumstances beyond their control (Ross & Fabiano, 1981). Although very little direct empirical evidence supporting these observations is available, it is suggested that a measure of internal-external locus of control be included in the test battery. Of the many I.E. measures available, the one we recommend for offenders is the Levinson's I.P. & C. Scales. This test, an adaptation of Rotter's scale, measures the individual's perception that his reinforcements are either contingent upon his own behaviour (internal control) or are the result of forces beyond his control and due to chance, fate, or powerful others (external control).

The I.P. & C. Scales are composed of items adapted from Rotter's Scale and a set of statements written specifically to tap beliefs about the operation of the three dimensions of control: beliefs in personal control (Internal Scale), powerful others (Powerful Others Scale, and chance or fate (Chance Scale). The final I.P. & C. Scales comprise three 8-item subscales with a 7-point Likert format which are presented to the subject as a unified scale of 24 items. High scores on each subscale are interpreted as indicating high expectations of control by the source designated. Low scores reflect tendencies not to believe in that locus of control.

Internal consistency estimates are only moderately high, but this is to be expected since the items sample from a variety of situations. For a student sample (N=152), Kuder-Richardson reliabilities yielded .64 for the I. Scale, .77 for the P. Scale and .78 for the C. Scale (Levinson, 1974). Wallston, Wallston & DeVellis (1978) found similar estimates for their adult samples (N=115), (.51, .72, & .73, respectively) as did Levinson (1973) for a hospitalized psychiatric sample (.67, .82, & .79). Split-half reliabilities (Spearman-Brown) are .62, .66, & .64 for the I., P., & C. Scales. Test-retest reliabilities are in the .60 - .79 range (Lefcourt, 1976, Levinson, 1973).

The validity of the I.P. & C. Scales have been demonstrated through convergent and discriminant methods which have shown significant low order correlations with other measures of the general construct as well as a pattern of theoretically expected positive and negative relationships with other variables. The scale has been used with alcoholic recidivists, prisoners, psychiatric patients and probationers.

Availability: Not commercially distributed. Source: H. Levinson, Multidimensional Locus of Control in Psychiatric Patients, Journal of Consulting and Clinical Psychology, 1973, Vol. 41 (3), 397-404. H.M. Lefcourt, Research with the Locus of Control Construct: Vol. 1, Assessment Methods. Toronto: Academic Press, 1981.

6. FIELD DEPENDENCE-INDEPENDENCE: GROUP EMBEDDED FIGURES TEST

Some research on cognitive functioning in offenders has found that they differ from non-offenders on measures of field-dependence-independence, that is on the degree to which their perception of an object in their visual field is dominated by or independent of the context in which the object appears. Field dependence-independence is a fundamental dimension of cognitive style which has been found to be characteristic of the individual's functioning not only in his perceptual but also his intellectual personality and social functions.

Field-dependent persons tend to be oriented to the physical rather than the social environment, and are sometimes cold, distant, and antagonistic to authority figures. Field independent people tend to have greater accuracy in person perception and are less egocentric in their social perception. Field-independent people are better able to achieve a different perception when required to do so. They are better able to restructure their perceptions and their thoughts, i.e., are more cognitively flexible. Field-independents show more initiative, responsibility and self-reliance. Finally, they are more analytical, have better control of their impulses, and higher self-esteem.

It would appear then, that offenders would be more likely to be field dependent. However, doubts about this are raised by the finding that field-independents may be more

demanding, inconsiderate, manipulative and cold and distant in their relations. Doubts about field dependence-independence differences between offenders and non-offenders are also suggested by the conflicting findings of research. Some studies found offenders to be field-dependent (Eskin, 1960), others, field independent (Offer et al., 1979). Insufficient research has been conducted on this topic to enable conclusions about this aspect of the offenders cognitive style, just as is the case on their characteristics on the related dimension of internal-external locus of control. However, because these cognitive style dimensions are very important, we have included measures of each in the battery and recommend they be used as research instruments.

The Group Embedded Figures Test (GEFT) was developed to measure the degree to which an individual is able to perceive discrete parts of an informational complex without being perceptually dominated by its overall organization. Subjects are required to outline (or trace) 18 simple figures which they have seen embedded within larger complex figures which have been so organized as to obscure the simple figure. Each simple figure which the subject outlines perfectly is given a score of one. Higher scores reflect greater field-independence.

Norms for the GEFT are available for both male and female college students. A parallel test reliabilily coefficient of R = .82 has been found for the GEFT (Witkin, Oltman, Raskin & Karp, 1971). The validity of the test has been established in a considerable body of research which has

been thoroughly reviewed by Witkin, Moore, Goodenough, & Cox (1977), and Witkin & Goodenough (1981).

Availability: Commercially distributed, e.g.: Guidance Centre, Faculty of Education, University of Toronto, 252 Bloor Street West, Toronto, Ontario M5S 2Y3.

7. CONCEPTUAL RIGIDITY:
GOUGH'S RIGIDITY SCALE

Although no direct empirical research has been reported on this characteristic of cognitive functioning in offenders, frequent reference is made in discussions of offender's cognitive style to the rigidity of their thinking, (e.g. Duguid 1980). Accordingly, we have included a measure of conceptual rigidity in the test battery for research purposes.

Gough's Rigidity Scale is a sub-test of the California Personality Inventory which measures the degree of flexibility and adaptability of an individual's thinking and social behaviour. The measure is a twenty-two item true/false scale which can be administered either individually or in groups.

A large proportion of the items consist of statements which reject the sorts of simple dogmatic assertions that characterize the authoritarian personality: "Our thinking would be a lot better off if we would just forget about words like probably, approximately and perhaps". Other items tap tolerance for uncertainty and ambiguity: "I don't like things to be uncertain and unpredictable".

Although we recommend its use as a research instrument, it should be noted that it is the least valid of the CPI scales and that whereas it does correlate negatively with measures of rigidity, it fails to relate positively to criteria of flexibility.

We have described in the appendix a measure of a characteristic which is related to conceptual rigidity and has also been held to be common among offenders: dogmatism. Dogmatism refers to a resistance to change one's systems of beliefs. The dogmatic person has a total cognitive configuration of ideas and beliefs organized into a relatively closed system. Rigidity, on the other hand, reflects difficulties in overcoming single sets or beliefs encountered in attacking, solving, or learning specific tasks or problems. We prefer the rigidity scale, both for theoretical reasons and because the Dogmatic Scale is too complex to be appropriate for many offenders.

Availability: Commercially available, e.g., Guidance Centre, Faculty of Education, University of Toronto, 252 Bloor Street West, Toronto, Ontario M5S 2V3.

8. CRITICAL THINKING:
WATSON-GLASER CRITICAL THINKING APPRAISAL

An important aspect of the individual's cognitive skills is his ability to appraise and present arguments, i.e. his ability to think and reason critically and rationally. Although there is very little empirical research on offenders' ability in critical thinking, we recommend inclusion of a test of this function in a cognitive test battery because of frequently reported observations of deficits in this area in offender populations (Aver, 1980; LaBar, 1980), and because it is a cognitive skill which is essential for effective social adaptation.

A large number of tests of critical thinking are available and several are discussed in Appendix I, (Ennis-Weir Argumentation Test; Butch & Slim; Cornell Critical Thinking Tests). We recommend use of the Watson-Glaser Critical Thinking Appraisal which is a battery of five paper and pencil sub-tests, suitable for administration to either individuals or groups. It is currently available in two parallel forms, each consisting of five sub-tests, designed to measure different, though interdependent, aspects of critical thinking. The one hundred items assess the following skills: inference, recognition of assumptions, (one's ability to recognize unstated assumptions taken for granted in given statements), deduction, interpretation (ability to weigh

evidence and to distinguish between generalizations from data not warranted beyond a reasonable doubt), and evaluation of arguments.

Split-half reliability coefficients have been reported to range from .40 to .74 for the sub-tests on both forms of the critical thinking appraisal. Split-half reliabilities for six normative samples ranged from .85 to .87 for the total test score. Its internal consistency is high and its concurrent validity is acceptable (Crites, 1965).

Availability: Commercially distributed by: Harcourt Brace Jovanovich, 757 Third Ave., New York, N.Y. U.S.A. 10017.

9. EMPATHY/ROLE-TAKING:
HOGAN'S EMPATHY SCALE

As indicated earlier, the cognitive deficits which have been found to be prevalent among offenders lie primarily in the interpersonal sphere. Many lack ability in cognitive tasks involving their awareness of the views of other people, their understanding of the behaviour and feelings of other people, and many have deficits in their ability to solve interpersonal problems (Ross & Fabiano, 1981).

We have included in the test-battery several measures of social perspective-taking skills. These are cognitive functions in which research has found offenders to have deficits. A closely related area, but one which has not yet been sufficiently studied among offenders, is empathy. By empathy we refer not to the offender's concern for others (sympathy), and not only his ability to feel what others are feeling, but also his ability to regard himself from the perspective of other people. In order to interact effectively with other people, the individual must be able to take into account the view that they have regarding him. It is possible that there is an underlying empathic capability, a cognitive ability which may be underdeveloped among offenders and may account for many of their interpersonal adjustment problems.

Hogan (1975) has developed a measure of empathy derived, in part, from Kelly's (1955) role-construct model which we

feel would be worthwhile to include in the cognitive-battery for research purposes.

Hogan's Empathy Scale is a sub-scale of the California Personality Inventory. It is designed to measure the intellectual comprehension of another's condition or state of mind without necessarily experiencing that person's feelings. The test is a 64-item self-report measure. Research has demonstrated that it predicts ratings of empathy better than all other existing measures (Hogan, 1975). It has also been found to correlate quite well with ratings of social acuity. It is negatively correlated with dogmatism and authoritarianism. Its reliability has been found to vary between .71 and .84. Although there are many other measures of empathy, most appear to assess the subject's concern for others and his appreciation of their feelings rather than the subject's ability to understand others or his ability to comprehend how other people view him.

Availability: Not commercially distributed as a distinct test.

Source: Journal of Consulting & Clinical Psychology, Vol.33 (3), 307-316.

CPI is available commercially, e.g. Guidance Centre, Faculty of Education, University of Toronto, 252 Bloor Street West, Toronto, Ontario M5S 2Y3.

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APPENDIX I

RELATED TESTS AND MEASURES

AC TEST OF CREATIVE ABILITY

The AC Test of Creative Ability measures the quantity as well as the uniqueness of ideas which individuals can develop in a given situation. It could be considered as an indicant of the individual's ability to generate alternative solutions in problem situations, a skill which has been found to be deficient among offenders.

The AC test is a paper and pencil device, suitable for administration to either individuals or groups. There are five parts of the test and the entire series takes 80 minutes to complete. It is available in two parallel forms, revised short forms, A and B. Each consists of five parts. Part I includes a twenty minute test containing five possible situations in which the subject is asked to list all possible consequences of each situation. Part II, a ten minute test of general reasoning ability, uses five unusual and not necessarily true statements. Part III, a fifteen minute test of sensitivity to problems, contains a list of five common appliances, and the subject lists any and all improvements that could be made in each. Part IV is a twenty minute test of practical judgement containing five problem situations, and the subject is asked to provide the solutions considered least expensive and time consuming. Part V, a fifteen minute test of originality, includes five common objects, and the subject lists all possible uses of each object. Parts I, II and V are used to yield both quantity and uniqueness scores. Part II yields a uniqueness score alone and Part IV yields a quantity score.

Norms are presented for 333 engineering and supervisory personnel, but no other descriptive normative data is presented. Research has found significant differences in mean performance on the AC Test of Creative Ability and judgement of high or low levels of creative ability. Other validity studies are reported, including type of engineering job and test performance, and also the relationship between the test scores on the AC and mental alertness as measured by the Wonderlic. Internal consistency reliability was found to be .92 for the total test. The correlation found between the scores from the parallel forms was .74. Further psychometric research on this instrument is required before it can be recommended as an integral part of assessment of problem-solving ability (alternative generation) in offenders. More generally, although assessment of creativity or creative thinking in offenders is an important area of research, there is as yet insufficient evidence of deficits in this area among offenders to warrant their inclusion in the cognitive test battery.

Availability: Industrial Relations Center, 1225 East Sixtieth Street, Chicago, Illinois, U.S.A. 60637.

BLOCK DESIGN

The Block-Design sub-test of the WAIS has been used in several studies with offenders as a measure of field dependence-independence (Offer, 1979; Witkin, 1981). It includes nine items in which the subject is presented with cards showing various designs and required to match the designs using coloured wooden blocks.

The Block Design may be particularly useful in assessing the offender's cognitive functioning since it provides an opportunity to observe his approach to an intellectually demanding non-verbal task. However, it requires individual and somewhat time-consuming administration and therefore, is not well suited for inclusion in a practical test-battery for large scale research. Moreover, the subject's score reflects a complex variety of skills, e.g., perceptual formation, visual-perceptual analysis, visual-motor integration, effectiveness of motor activity, and synthesis of colour vision. We prefer to include in our battery the Embedded Figures Test.

Availability: Commercially distributed, e.g. Guidance Centre, Faculty of Education, University of Toronto, 252 Bloor Street West, Toronto, Ontario M5S 2Y3.

"BUTCH AND SLIM"

This test is a measure of propositional logic and has been used for assessment of offenders' critical thinking. The materials consist of four cards, on each of which appear two caricatured criminals, "Butch" and "Slim". Under each is written "Yes, I did rob the bank." or "No, I did not rob the bank". The cards are spread out before the subject, and the subject is told that this is a game about a bank robbery, in which two well known criminals are suspected. The subject is then told that supposing that the two were taken in and questioned together about whether they committed the crime, they could answer in only four different ways: (as pictured in the four cards): both could say "yes"; Butch might say "yes" and Slim "no"; both could say "no"; Butch could say "no" and Slim say "yes". The subject is then presented with a series of sixteen propositions made by Butch to the police and asked to indicate which card satisfies the conditions where Butch was telling the truth. The test is scored in terms of the logic of the subject's response.

The "Butch and Slim" game is easily administered and has appeal for the testee and considerable face validity.

However, only moderate reliability has been demonstrated for the measure.

Availability: Not commercially distributed. Source: Riley, J.M., An Analysis of the Relationship Between Qualitative Cognitive Abilities and Juvenile Delinquency. (Doctoral Dissertation, Boston College). Ann Arbor, Michigan, or Ward, J. & Pearson, L. A Comparison of Two Methods of Testing Logical Thinking. Canadian Journal of Behavioural Science 1973, 5(4), 385-398.

CLOSURE FLEXIBILITY (CONCEALED FIGURES)

This test measures an individual's capability to hold a picture in mind despite distraction, and has been suggested as a measure of field dependence-independence. It is a paper-and-pencil test, suitable for administration to either individuals or groups which measures the ability to perceive a given figure which is "hidden" or embedded in a larger, more complex drawing, diagram or figure. The test consists of forty-nine items, each of which is comprised of a stimulus figure on one side of the page followed by a row of four alternative figures. Some of the alternative figures contain the stimulus figure in its original size and orientation. The subject responds by indicating those figures which contain the stimulus.

The present form of the Closure Flexibility Test is a refinement of the earlier Gottschaldt Figures Test. Determination of the validity of Closure Flexibility is based on results obtained with the Gottschaldt Test, and on studies which have found correlations between .59 and .63 with tests of analytical and inductive reasoning. Split-half reliability coefficients varying between .78 and .94 have been reported. Norms are available on test performances of 1,105 male industrial employees in a wide range of positions. We recommend the Group Embedded Figures Test, but suggest that the Closure Flexibility Test might be used as an alternative.

Availability: Industrial Relations Center, 1225 East Erie Street, Chicago, Illinois, U.S.A. 60637.

COGNITIVE DIAGNOSTIC BATTERY

This is a method for assessing and differentiating among various aspects of cognitive dysfunction: conceptual development, perservation, random responsiveness, abstract-symbolic reasoning, egocentric vs. socialized and objective thinking, perceptual-motor development, attention span, and psychomotor rate. The battery consists of five individual tests which measure not only the degree of intellectual deficit but also the nature. Its aim is to provide qualitative

as well as quantitative assessment of the cognitive disorders which prevail in many of the major clinical conditions. The battery consists of the following:

1. Colour-Form Preference Test (CFP): This is a 20-item similarity judgement test in which a standard card can be matched with one of three comparison cards according to colour cue, form cue, or neither. From analysis of the response pattern, a measure of the characteristic conceptual style and its prevalence is statistically derived and translated into one of four hierarchical stages of early cognitive development. This scale examines the primitive bases for perceiving relationships and preconceptual modes of thinking. A second scale provides evaluation of arousal-related cognitive disturbance. Reliability indices range from .82 to .85.

Each of the five tests which comprise the battery, are administered and scored individually, according to their own specific instructions and procedures provided. Instructions are simple and do not require verbal response. The tests are also brief and self-paced, each requiring only 1 to 6 minutes to administer.

2. Colour Form Representation Test (CFR): An extension of the CFT, the CFR is a more advanced similarity judgement test which evaluates conceptualization by more complex and symbolic cues. A reliability index of .87 has been found for the CFR (Garrett, 1964).

3. Egocentricity of Thought Test (EOT): The EOT consists of four test levels depicting the four major phases of cognitive-social development identified by Piaget. One's performance suggests whether thought and judgement are self-centred and subjective, reliant on social orientation, or relatively independent of subjective and interpersonal cues. A reliability index of .82 has been found (Garrett, 1964).

4. Progressive Figure Drawing Test (PFDT): The PFDT delineates level of perceptual-motor development in patients with combined developmental and psychiatric disorders. The procedure consists of drawing, from copy, seven simple designs that children normally master at successive age periods between 2 and 6 years. A reliability index of .96 has been reported (Garrett, 1964).

5. Span of Attention Test (SOA): This test provides a temporal measure of concentration and distractibility based on the average length of time one sustains concentration on a rote motor task. A reliability index of .82 has been reported (Garrett, 1964).

Standardization of the CDB has included data collected on normal adults, elderly persons, children, hospitalized schizophrenics and mentally retarded psychotics. The battery has achieved satisfactory reliability ratings in terms of split-half analysis and test-retest comparisons of schizophrenics under pre-treatment conditions, (Kay, 1981). A multi-dimensional correlational study has yielded evidence of convergent and discriminant validity, (Kay, 1981).

The test has been used primarily with psychiatric patients. Its use with offenders remains to be examined.

Availability: Psychological Assessment Resources Inc., Odessa, Florida, U.S.A. 33556.

CONCEPTUAL LEVEL: PARAGRAPH COMPLETION METHOD

This test assesses a person's position on the continuous Conceptual Level dimension which is defined in terms of "increasing conceptual complexity as indicated by discrimination, differentiation and integration and, increasing interpersonal maturity as indicated by self-definition and self-other relations" (Hunt, Butler, Noy and Rosser, 1978, p.3). It is a group administered, semi-projective method of assessing thought samples related to how a person thinks about such ambiguous topics as conflict, uncertainty, rule structures, and authority (Hunt, et al., 1978). Specifically, the method consists of six topics: "What I think about rules..."; "when I am criticized..."; "what I think about parents..."; "when someone does not agree with me..."; "when I am not sure..."; and "when I am told what to do...". To each of these, subject must respond with three or four sentences, indicating his own personal reactions to it.

A person's CL is calculated by assigning a score from 0-3 to each of the six responses and by aggregating these separate scores into a total CL score. Specific examples are given for scores on each topic. The most difficult part in scoring is learning to determine both the thought structure underlying the response and its content. The test is timed. Subjects are given three minutes to respond for each of the six topics. The higher the subject's total score, the more the subject can be taught to need less structure in the learning environment, develop increasing conceptual complexity, and develop interpersonal maturity.

Norms are provided for a large number of different reference groups. In a group of 26 separate reliability studies, for a large number of different reference groups, the median interrater reliability estimate was .86 (Hunt, et al., 1978). Gardiner & Schoeder, 1972 reported a 3 month test-retest reliability estimate of .67 in a group of 36 college students.

Hunt & Hardt (1965) found the incidence of both observed and reported delinquency to be higher for boys in the very low CL group than in the group with higher CL scores.

We would recommend this test for use with offenders were it not for our reservations about the ease of motivating offenders to engage in writing, and the subjective judgements which are required for scoring.

Availability: Ontario Institute for Studies in Education, 252 Bloor Street West, Toronto, Ontario M5S 1V6.

CONCEPTUAL SYSTEMS TEST

The Conceptual Systems Test (CST) has been designed to yield a measure of the individual's conceptual functioning on the concrete-abstract dimension. This test, a 48-item Likert-type instrument assigns individuals to one of six stages or levels of conceptual functioning. The stages range from the concrete level (conceptual functioning which is characterized by a lack of integration of concepts) to the abstract level (functioning which is characterized by high integration of concepts).

The CST is a revised version of the I Believe Test (TIB) which was demonstrated in a considerable number of studies to have high construct and predictive validity (Felknor & Harvey, 1970; Harvey, 1963, 1964, 1965, 1966, 1967; Harvey & Ware, 1967; Ware & Harvey, 1967; White & Harvey, 1965). The CST was developed from the earlier test in order to provide a measure which, unlike the TIB, did not require independent judges to assign levels to the testee. The CST can be scored objectively and can be readily subjected to computerized scoring procedures.

The CST, in turn, has been refined considerably since it was first described by Harvey in 1967. The final version is the CST-71. It consists of a questionnaire comprising 48 self-statements about the way the subject feels about various social and personal issues. The testee is asked to indicate, on a five point scale, the degree to which he agrees that each statement applies to him.

Based on extensive cluster analysis, the CST provides scores on the following six measures which have been found to be internally consistent and reliable:

- Divine Fate Control: the conviction that a divine being has, and ought to have control of a person's life.
- Need for Structure-Order: the desire for the various aspects and situations of a person's life to be highly organized and arranged.

- Need to help people: the feeling of satisfaction derived from and the importance attached to doing things for others.
- Need for people: the feeling that contact with people is very important and constitutes a primary source of one's own satisfaction.
- Interpersonal Aggression: the feeling that a person will, or is likely to, express hostility toward others when they do something the person does not like.
- General Pessimism: the feeling of general distrust of people, especially those in power such as politicians.

Subjects are assigned to a conceptual system category based on their scores on the six-cluster measures. This assignment is done through a statistical profile analysis (Hoffmeister, 1976). Thus, the individual's conceptual system category assignment depends on the pattern of his scores on the six measures and not only on his score for any one measure. Subjects can be classified as concrete or abstract in conceptual functioning on the basis of their system categories.

Research has demonstrated that individuals can be assigned to the two groups (conrete vs. abstract) with an accuracy of 80% (Hoffmeister, 1976). Assessment of the reliability of the CST has also been favourable: .80 to .90 (Hoffmeister, 1976).

Availability: Test Analysis & Development Corp., 2400 Park Lane Drive, Boulder, Colorado, U.S.A.

CORNELL CRITICAL THINKING TESTS

This test measures critical thinking defined as the reasonable assessment of statements. It consists of two general critical thinking tests which attempt to deal somewhat comprehensively with critical thinking. Of the two tests, Level X is somewhat easier. It is appropriate for students from the junior high (about age 13) level or up. Level Z consists of group related items and is a bit formidable for the average secondary student. It is best adapted to people with higher education, but high ability secondary students can cope with it.

Level X ask questions about a story about a group of explorers who land on an unfamiliar planet, Nicoma, and who must deal with a number of problems. Questions are asked on the bearing, if any, of information on a hypothesis. It

assesses the ability to judge the reliability of information on the basis of its source and the conditions under which it was secured. It taps the ability to judge whether a statement follows from premises. The basic principles of deductive logic are also tested.

Level Z consists of 7 sections and 52 working items. It assesses the ability to tell whether a statement follows from premises, the ability to detect equivocal arguments, circularity, and oversimplification. It is also concerned with the reliability of observations and authenticity of sources. Finally, it assesses the subject's hypothesis-testing procedures and his ability to detect assumptions.

The tests are essentially self-administered. Research with students indicate that the reliability for Level X is moderately high. Estimates range from .77 to .87. Reliability estimates for Level Z range from .55 to .77.

It must be questioned whether this test is suitable for the offender population because many may lack the educational background or the verbal skills to deal with the materials.

Availability: Critical Thinking Project, School of Education University of Illinois, 371 Education Building, Urbana, Illinois, U.S.A. 61801.

DEVELOPING COGNITIVE ABILITIES TEST

The DCAT measures student's learning characteristics and cognitive abilities that contribute to his academic performance. Performance is measured in 3 content areas: verbal ability, quantitative ability, and spatial ability. Information is provided on the 5 cognitive levels of Bloom's Taxonomy: knowledge, comprehension, application, analysis, and synthesis. The test is group administered and hand scorable.

It is a new test which may prove valuable because of its unique combination of measures of content and cognitive level. However, adequate information is not yet available.

Availability: Commercially distributed by Gage Publishing Ltd., Toronto.

DIFFERENTIAL APTITUDE TEST: TEST OF ABSTRACT REASONING

This is a non-verbal measure of an individual's ability to perceive relationships in abstract figure patterns, to generalize and deduce principles from non-language designs.

The series presented in each problem requires the perception of an operating principle in the changing diagrams. In each instance the individual must discover the principle governing the change of the figures and give evidence of his understanding by designating the diagram which should logically follow. In each case the task requires the ability to generalize the changes into operating principles - thinking with abstract symbols. Complexity is obtained from increasing conceptual difficulty. The differences are apparent; discerning why the patterns differ is the intellectual exercise.

The test can be readily given and easily scored. Complete and explicit descriptions and directions are provided. The test is timed, requiring approximately 25 minutes. However, this test has been used primarily for academic and vocational prediction. Its relationship to abstract thinking involved in the socio-cognitive functioning of offenders has not been determined.

Availability: The Psychological Corporation, 522 Fifth Ave., New York, N.Y., U.S.A.

DOGMATISM SCALE

The Dogmatism Scale is a 66 item scale which measures individual differences in open and closed belief systems. The scale also claims to measure general authoritarianism and intolerance. The more closed the system, the more is the acceptance of a particular belief assumed to depend on irrelevant internal drives and/or arbitrary reinforcements from external authority.

The test is group administered and scored along a continuum from +3 (agree strongly) to -3 (disagree strongly). The samples for whom reliability data were initially obtained came from three areas differing in social climate: the Midwest (college students), New York (beginning psychology students and a group of aged, destitute veterans), and England (college students). The reliabilities of the final form of the Dogmatism Scale range from .68 to .93.

Plant (1960) in a study to determine whether Rokeach's Dogmatism Scale is a measure of general authoritarianism, concluded the following: "We take these data as support of Rokeach's contention that the Dogmatism Scale is less loaded with prejudice than is the California F. Scale, and as an indication that the Dogmatism Scale is a better measure of general authoritarianism than the California F Scale". We prefer to use Gough's Rigidity Scale which appears to more clearly tap offenders' cognitive deficits.

Availability: Rokeach, M. The Open & Closed Mind. New York: Basic Books Inc. 1960.

ENNIS-WEIR ARGUMENTATION TEST

This test is a measure of rational thinking ability in the context of argumentation. It purports to assess the ability to appraise an argument and to formulate an argument in response. It calls for both critical and creative thinking ability.

The test consists of an argument presented in a letter to the editor of a fictitious newspaper. The writer of the letter is discussing a solution to a parking problem. He supports his proposal with a variety of arguments, each in a separate numbered paragraph - nine in all. Each paragraph exemplifies at least one of the points. Examinees are instructed to read the letter and then to write a nine-paragraph essay evaluating the argument in each paragraph and in the letter as a whole. The areas of argumentation competence covered are: getting the point, seeing the reasons and assumptions, stating one's point, offering one's point, offering good reasons, responding appropriately to and/or avoiding equivocation, irrelevance, circularity, reversal of a conditional relationship, neglect of alternatives, overgeneralization, and excessive skepticism.

The test may be individually or group administered. In studies with students at college level, interrater reliability was found to range from .72 to .74. Although the test provides realistic content, it requires substantial time and expertise to score and there is very limited information on its reliability and validity.

Availability: Critical Thinking Project, School of Education, University of Illinois, 371 Education Building, Urbana, Illinois, U.S.A. 61801.

FEUERSTEIN'S LEARNING POTENTIAL ASSESSMENT DEVICE (LAPD)

A number of measures of cognitive functioning have been employed in Feuerstein's Learning Potential Assessment Device as an integral part of Feuerstein's Instrumental Enrichment (Feuerstein, 1979). Many of these tap the level of functioning on the concrete-abstract reasoning dimension. The measures are both assessment and training devices which appear to have potential for use with offender populations within the general context of Feuerstein's approach to cognitive development theory and training procedures. The measures tap a considerable number of cognitive functions including planning, impulsivity, alternative-thinking, and flexibility.

The four measures in the LAPD include:

1. Organization of Dots Test: assesses four functions: the ability to perceive relationships; the ability to articulate the field by a process of analysis; the ability to plan ahead; the need for precision.

2. Plateaux Test: a means of evaluating and measuring the individual's capacity to be affected by an educational process.

3. Raven's Progressive Matrices.

4. Representational Stencil Design Test (RSDT): measures concrete and abstract thinking.

The LPAD provides an innovative approach to assessment particularly since it focusses on ascertaining the subject's potential for learning rather than merely measuring present functioning level. We have not included the LPAD in the battery because it has not been used sufficiently extensively with offenders.

I-LEVEL CLASSIFICATION SYSTEM

This system of classification has been widely used with juvenile offenders. It provides a means of differentiating individuals according to their interpersonal maturity level (I-Level). It assesses the perceptual frame of reference or cognitive world by which the individual integrates his experience. This frame of reference changes and becomes more differentiated and capable of dealing with more complex stimuli as the individual develops. Seven successive levels of development of integrations have been described. However, the classification system has been applied almost exclusively to offenders at levels I_2, I_3, and I_4.

The Sequential I-Level classification method is derived from the Jesness Inventory and Jesness Behaviour Checklist (Self-Appraisal Form). The probabilities for level and subtype were derived independently. In arriving at a diagnosis, I-level is first determined, then subtyped within that level. The Jesness Inventory probabilities are used as the first step. If inventory probabilities are not sufficiently high to call for a single classification, the probabilities from the Behaviour Checklist are used in conjunction with those of the Inventory Measurement Instruments.

The Jesness Inventory is a 155 true-false item test providing scores on 10 personality characteristics. It can be administered either by a tape recorder or by use of text booklets. It can be given to individuals or to large groups. In either case, the directions are the same. The taped version

takes approximately 35 minutes. The booklet form takes 20 to 40 minutes depending upon the individual's reading speed. Special training is not required to administer the test.

The Jesness Behaviour Checklist is an 80-item test on which the subject rates the frequency of his behaviour on a 5-point scale. The BCL can be administered either by tape recorder or by the use of test booklets. The 80 items measure 14 bipolar behaviour factors.

I-level classification can also be made on the basis of a semi-structured interview in which the offender is asked about his delinquent behaviour, his family, school, friends, and plans for the future. His performances are then rated on the interview rating questionnaire (IQR) according to level and subtypes.

Although doubts have been raised about the validity of the I-level system and theory (e.g. Zaidel, 1973), it is included here because it represents an extensive measurement and classification system which is based on a view that the offender's socio-cognitive development is an important determinant of his behaviour.

OBJECT ASSEMBLY (WAIS)

This sub-test of the WAIS has been suggested as a measure of field articulation. It consists of four items, each of which is a timed jigsaw problem. Correct performance requires a wide number of skills: visual-motor coordination, visual-perceptual synthesis, visual-motor integration, and speed and precision of motor activity. The subject must form anticipations from presented parts to an unknown whole and put parts together to form familiar configurations.

Because of the large number of skills on which performance depends and practical considerations in administering the test in large-scale research, we recommend it only as an alternative to the Group Embedded Figures Test. However, the Object Assembly has many qualitative merits. It reflects thinking and working habits. It reveals modes of perception, degrees of reliance on trial and error methods, and typical reactions to mistakes and failure. It reflects the ability to work toward an unknown goal, and to persist at a task. Most of the factor variance is accountable by non-verbal organization. Coefficients of reliability for the Object Assembly range from .49 to .74.

Availability: Guidance Centre, Faculty of Education, University of Toronto, 252 Bloor Street, West, Toronto, Ontario M5S 2Y3.

PORTEUS MAZE TEST

This test is designed to measure both practical intelligence and impulsivity, defined as "planning, capacity, foresight, and ability to learn from experience" (Porteus, 1965). Two scoring systems are provided: one for a general intelligence factor and the other a qualitative or "Q" score for impulsivity. The test has been used frequently to measure impulsivity (Doctor & Winder, 1954).

The test consists of a series of progressively more difficult mazes, which are given to a subject until he fails to pass all the trials at a given age level. A trial is failed when a blind alley is entered by the subject, and at this point a new copy of the same maze is given to the subject and a new trial is begun.

In spite of the fact that the Porteus Maze has been in relatively continuous use for over 60 years, there is still no adequate reliability information on either the "intelligence" or the "impulsivity" scoring system (Horn, 1972). Moreover, serious questions have been asked as to whether the test measures impulsivity or only some general trait characteristic of institutionalization (O'Keefe, 1975), and factor analytic studies suggest that the Q-score should not be interpreted as indicative of a single trait such as impulsivity (Doctor, 1972). The Q-Score depends on the quality of attention and learning when instructions are given, and on a multitude of personality and cognitive differences which can influence one's total style of response (Doctor, 1972). The test appears to have considerable face validity as a task requiring short-term planning toward the solution of printed mazes. However, how this may generalize to other kinds of planning and learning essential to solving different kinds of problems, remains to be determined.

Availability: Distributed commercially e.g.: Guidance Centre, Faculty of Education, University of Toronto, 252 Bloor Street West, Toronto, Ontario.

RAVEN'S ADVANCED PROGRESSIVE MATRICES

The Advanced Progressive Matrices Sets I & II is a test which indicates whether a person is intellectually "dull", "average" or "bright". It is also a test of intellectual efficiency. It has also been suggested as a measure of impulsivity.

The test consists of a series of matrices. The subject is directed to select from a number of designs, the one that completes a pattern. Figures are altered from left to

right according to one principle, from top to bottom according to another. The subject must identify these principles and apply them.

The test provides the analytical and integral operations involved in the higher thought processes and differentiates clearly between people of even superior intellectual ability. It provides a reliable estimate of the efficiency of a person's capacity for coherent perception and orderly thinking under stress. With adults of more than average intellectual capacity it has high re-test reliability. It also is short, easy to administer, and non-verbal. It can be administered individually or in a group. However, we have major reservations about its use as a measure of impulsivity because there has been insufficient research on its value for such purposes and low scores which might reflect impulsivity may reflect too many other factors.

Availability: Institute of Psychological Research, 34 Fleury Street West, Montreal, Quebec, H3L 1S9.

SELMAN'S TEST OF SOCIAL PERSPECTIVE-TAKING

This is a measure which attempts to identify levels of social perspective taking in individuals through their resolutions of hypothetical moral dilemmas. This measure is rooted in cognitive development theory especially as conceived in terms of moral reasoning. Selman has identified a system of five levels of social perspective-taking. The levels describe changes in an individual's understanding of the interactional character of the self and others at the same time the levels describe changes in the subject's theory of what constitutes an individual (himself or others).

The test presents to the subject a number of moral dilemmas which are well-suited to the task of weighing various points of view. The dilemmas encourage the subject to spontaneously elaborate on his theory of human rights, his beliefs about motives and feelings, and his strategies for resolving conflict. A number of cross-sectional and longitudinal studies have provided strong support for the differentiation of levels of perspective taking (Selman, 1980). However, the available information on validity and reliability is limited, the test is probably appropriate for children but may not be for adults, and the scoring involves a considerable degree of subjectivity.

Availability: Not commercially distributed. Source: Selman, R.L., The Growth of Interpersonal Understanding Developmental & Clinical Analysis, Academic Press: 1980.

WISCONSIN CARD SORTING TEST

This test was originally developed to assess abstraction and "shift of set" ability in normals, but it has gained popularity as a clinical neuro-psychological instrument. Unlike many other tests of abstraction, the WCST can provide objective measures not only of overall success, but also of particular sources of difficulty on the task: e.g., inefficient initial conceptualization, perservation and failure to maintain set.

The WCST uses stimulus cards and response cards that display figures of varying forms, colours, and numbers. Four stimulus cards are placed before the subject: one red triangle, two green stars, three yellow crosses, and four blue circles. The subject is then handed a deck of response cards and instructed to place each consecutive card from the deck in front of one of the 4 stimulus cards, wherever he thinks it should go. The subject is informed only whether each response is right or wrong, and is not told the correct sorting principle. Once the subject has made a specified number of consecutive sorts according to the initial "correct" principle (e.g., to colour), without warning the criterion principle is changed to form or number. The test proceeds in this manner through a specified number of shifts of the three possible sorting categories (colour, form and number).

Although this test has been suggested as a measure of abstraction with offenders, we have reservations about its use except for clinical purposes and as a neuropsychological device. It has not as yet been used sufficiently with offenders to determine its value. Moreover, wide variations have been noted in the stimulus items and at least 32 different scoring methods have been used. It is, perhaps, best used when neuropsychological problems are suspected to underly the offender's deficits in abstract reasoning rather than as a research instrument or screening device for abstract reasoning ability.

Availability: Psychological Assessment Resources Inc., P.O. Box 98, Odessa, Florida, U.S.A. 33556.

APPENDIX II

Adjective Checklist
Adolescent Problems Inventory
Basic Assumptions Test
Bender-Gestalt
Bennett's Self-Esteem Scale
Burgess' Assessment of Formal Operations Thought
Canadian Achievement Test
Canadian Cognitive Abilities Test
Closure Speed
Coomb's Alternative Generation
Diplomacy Test of Empathy
Empathy Test
Emphatic Fantasy Scale
Feffer's Role-Taking Task
Flavell's Role-Taking Ability
Forer Structured Sentence Completion Test
Fundamental Interpersonal Relations Orientation-Behaviour (FIRO-B)
Hypomania Scale (MMPI)
Illinois Test on Assessing Observational Statements
Informal Fallacy Recognition Scale
Johnston's Scale of Social Perspective-Taking
*Kit of Reference Tests for Cognitive Factors.
Lincoln-Osterestsky Test of Motor Development
Loevinger's Measure of Ego Development
Ohio Classification System
Peabody Picture Vocabulary Test
Perceptual Speed Test
Remote Associates Test
Role Construct Repertory Test
Role-Taking Scale (CPI)
Rotter's Internal-External Locus of Control Scale
Russell Sage Social Relations Test
Self-Control Scale (CPI)
Space Thinking (Flags) Test
Tennessee Self Concept Scale
Test of Behaviour Rigidity
Test of Cognitive Skills
Thurstone Test of Mental Alertness
Torrance Test of Creative Thinking

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* This kit contains a large number of tests of a wide variety of cognitive functions. Some of the tests are included in our battery; others have been rejected as not relevant or inadequate. The kit does provide a comprehensive assessment battery of cognition, but no tests of social cognition are

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