A META-ANALYSIS OF THE PREDICTORS OF ADULT OFFENDER RECIDIVISM: WHAT WORKS!*

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Meta-analytic techniques were used to determine which predictor domains and actuarial assessment instruments were the best predictors of adult offender recidivism. One hundred and thirty-one studies produced 1,141 correlations with recidivism. The strongest predictor domains were criminogenic needs, criminal history/history of antisocial behavior, social achievement, age/gender/race, and family factors. Less robust predictors included intellectual functioning, personal distress factors, and socioeconomic status in the family of origin. Dynamic predictor domains performed at least as well as the static domains. The LSI-R was identified as the most useful actuarial measure. Recommendations for developing sound assessment practices in corrections are provided.

Verification of the risk factors most predictive of adult offender recidivism and identification of the actuarial instruments best suited to that end have major implications for corrections policymakers, practitioners, and program evaluators. The cost-effective and humane management of prisons, particularly in light of the dramatic increase in incarceration rates (Mauer, 1994), dictates that maximum security prisons be reserved for the highest risk offenders. Moreover, the design of effective offender treatment programs is highly dependent on knowledge of the predictors of recidivism (Gendreau et al., 1994).

Andrews and Bonta (1994) identify two categories of risk factors: static and dynamic. Static factors (i.e., age, previous convictions) are aspects of the offender's past that are predictive of recidivism but cannot be changed. Dynamic risk factors, or what Andrews and Bonta commonly refer to as criminogenic needs (e.g., antisocial cognitions, values, and behaviors), are mutable and thus serve as the appropriate targets for treatment (Andrews

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et al., 1990a). There is, however, little consensus regarding the measurement of specific offender risk factors.

PREDICTORS OF RECIDIVISM

There is no disagreement in the criminological literature about some of the predictors of adult offender recidivism, such as age, gender, past criminal history, early family factors, and criminal associates. There has been, however, considerable controversy and/or lack of interest in dynamic risk factors. There are three reasons for this. First, because of ideological concerns and the professional self-interest of significant segments of the professions of criminology and sociology, the import of individual differences (i.e., offender needs, abilities, attitudes, and personality styles) has been derided in some criminological literature (Andrews and Wormith, 1989; Rowe and Osgood, 1984; Wilson and Herrnstein, 1985).

Second, some methodologists (e.g., Jones, 1996) have expressed skepticism about dynamic risk factors because of their supposed unreliability. Unlike their static counterparts, dynamic risk factors can change over time and their measurement involves some degree of subjectivity. Since elementary psychometric theory reminds one that unreliability in measurement necessarily leads to an underestimation of validity (Cronbach, 1990), this line of reasoning implies that, collectively, dynamic variables must be relatively weak predictors of criminal behavior.

Third, criminal justice professionals have been, by and large, antipathetic to the possibility that assessment of criminogenic needs might enhance the prediction of criminal behavior (Bonta, 1996; Gendreau and Ross, 1987). The widely used Wisconsin classification system (Baird, 1981) illustrates this point. This instrument contains a useful needs component, but Bonta (1996) found just two studies that reported on the predictive validity of those items. Further, the emergence of the "new penology" (Feeley and Simon, 1992), which is concerned with managing large aggregates of offenders in a simplistic input-output, businesslike fashion, has further contributed to the lack of interest in dynamic variables.

This denial of the utility of dynamic risk factors has serious ramifications for corrections professionals who are routinely required to reclassify offenders for prison transfers, parole/probation supervision, and treatment services. Simply put, reclassification is devalued if the measurement of change has little validity.

Three specific types of predictors have also been the subject of much debate. They are social class of origin, intelligence, and personal distress. Social class of origin (i.e., parents' occupation, education), has been the bedrock variable used in support of sociological theories of crime that assert that criminal behavior is determined largely by one's social location

(Andrews and Bonta, 1994). Tittle and Meier (1990, 1991) have challenged this view, showing social class of origin (socioeconomic status, or SES) to be a very weak predictor of juvenile delinquency.

The view that criminals are less intelligent than nonoffenders has been prevalent for decades (Goddard, 1920). Over the years, a number of studies have demonstrated a correlation between intelligence and delinquency (Hirschi and Hindelang, 1977). Recently, with the publication of *The Bell Curve* (Herrnstein and Murray, 1994), arguably the strongest claim yet has been made that IQ is a particularly powerful predictor. Their conclusions have serious implications for the provision of treatment programs for offenders, since IQ, in their view, is considered to be largely immutable.

According to Andrews et al. (1990a) personal distress variables (e.g., low self-esteem, anxiety) are not risk factors and are, therefore, inappropriate targets for treatment. Their conclusions are in stark contrast to the practices of many therapists and programs that give priority to lowering offenders' anxiety level and raising their self-esteem. The genesis of this perspective is, most likely, a consequence of the training received in mental health theory and practice (e.g., psychodynamic theory, phenomenology), where treatment professionals initially gained experience before emigrating to corrections in the 1960s (Gendreau, 1996). The current widespread popularity of the recovery and self-help agendas (see Kaminer, 1992) lends further credibility to the notion that personal distress factors are suitable targets for intervention, a view which in our opinion, has been generalized to corrections, where surveys of treatment programs have found that it is not uncommon for programs to attempt to alleviate offenders' personal distress (Gendreau et al., 1990; Hoge et al., 1993).

To date, reviews of the evidence concerning the predictors of recidivism have been limited in scope and narrative in nature—except for two reviews that employed meta-analytic procedures. One meta-analysis, however, was quite preliminary (Gendreau et al., 1992), and the other was restricted to twin and adoption studies that combined juvenile and adult samples (Walters, 1992).

ACTUARIAL MEASURES FOR PREDICTING RECIDIVISM

Bonta (1996) has categorized risk assessment measures within a developmental framework. First-generation techniques are based on clinical intuition and professional judgment. There is a plethora of literature documenting the lack of validity of this approach (Meehl, 1954), even among the most highly trained clinicians and scholars (Little and Schneidman,

1959). This perspective is still commonplace among corrections professionals (Clear and Gallagher, 1985).

Second-generation assessments are actuarial in nature. They are based on standardized, objective risk prediction instruments, such as the Salient Factor Score (SFS) (Hoffman, 1983), that are based almost entirely on static criminal history items. These kinds of measures provide little direction for classification and treatment decisions because the fixed nature of the items does not allow for changes in the offender's behavior to be reflected on subsequent retesting.

Bonta's third generation consists of two types of instruments. One of them encompasses risk prediction measures that include dynamic factors (e.g., Community Risk/Needs Management scale, Motiuk, 1993; Level of Service Inventory (LSI-R), Andrews and Bonta, 1995; the Wisconsin system, Baird, 1981), which assess a wide range of criminogenic needs. The second type includes personality test scales in the antisocial personality/sociopathy/psychopathy content area. While these scales (e.g., the MMPI Pd scale, the Psychopathy Checklist (PCL-R), Hare, 1991; the Socialization scale (Soc) of the California Personality Inventory (CPI), Gough, 1957) do contain static items, the majority of items are dynamic in nature.

Reviews of the risk-measure literature have also been, with one exception (Simourd et al., 1991), narrative in nature. Their meta-analysis reported that the PCL-R and the Soc scale of the CPI were better predictors of recidivism than the MMPI Pd scale. Unfortunately, most of the studies available to the authors were postdictive.[1]

A final comment concerns the fact that the validity of various theories of criminal behavior relies, somewhat, on the prediction literature. Anomie/strain (Merton, 1957) and subcultural theories (A. Cohen, 1955; Matza, 1964) support SES and, to some extent, personal distress as strong predictors. Contemporary reformulations of differential association, social learning, and control theories (Andrews and Bonta, 1994; LeBlanc et al., 1988; Widom and Toch, 1993) center on antisocial peers, learned antisocial values, early criminogenic family factors, and personality dimensions (e.g., egocentricity). Strong biologically oriented theories base much of their credence on IQ and twin studies (see Herrnstein and Murray, 1994; Walters, 1992).

In summary, our review of the literature on predictors of recidivism for adult offenders has indicated a need for a comprehensive, quantitative

1. Brief mention should also be made of a few quantitative within-subject study prospective comparisons of several risk instruments and personality scales (Gendreau et al., 1979a, b; Gough et al., 1965; Motiuk et al., 1986; Motiuk, 1991; Serin et al., 1990). The results from these studies indicated that, in most instances, risk measures (SFS, LSI-R) were better predictors of offender recidivism than were antisocial personality scales such as the MMPI Pd.

research synthesis (i.e., meta-analysis) of the major classes of predictors of recidivism and the available prediction instruments. The potential advantages of meta-analysis over narrative reviews have been summarized in detail elsewhere (Cooper and Hedges, 1994). It has become the review method of choice in many applied areas (e.g., Lipsey and Wilson, 1993) and has recently led to advances in knowledge in the correctional field (Andrews et al., 1990b; Bonta and Gendreau, 1990; Gendreau and Andrews, 1990; Lipsey, 1992; Walters, 1992).

The questions we address in this study are as follows:

1. Which predictor domains predict recidivism, and are some more potent than others?
2. Are dynamic predictors as a group inferior to static predictors in their ability to predict recidivism?
3. Are there differences among composite measures of risk prediction instruments and measures of antisocial personality in their ability to predict recidivism?
4. Are the strongest predictors of recidivism associated with different theories of criminal behavior?
5. What guidelines are forthcoming from the meta-analysis that will assist criminal justice professionals in making more accurate assessments of criminal behavior?

METHOD AND PROCEDURE

SAMPLE OF STUDIES

A literature search for relevant studies published between January 1970 and June 1994 was conducted using the ancestry approach and library abstracting services. For a study to be included, the following criteria applied:

1. Data on the offender were collected prior to the recording of the criterion measures. A minimum follow-up period of six months was required. If a study reported more than one follow-up period, data from the longest interval were used.
2. Treatment studies that directly attempted to change offender personality or behavior were not included.
3. The criterion or outcome measure of recidivism had to be recorded when the offender was an adult (18 years or older).
4. The criterion or outcome measure had to have a no-recidivism category. Studies that used "more" versus "less" crime categorizations were not used. The criterion measures were arrest, conviction, incarceration, parole violation, or a combination thereof.
5. The study was also required to report statistical information that

could be converted, using meta-analytic formulas (Rosenthal, 1991), into the common metric or effect size of Pearson *r*.

CODING THE STUDIES

For each study the following information was recorded:

1. Coder characteristics: date, coder identity.
2. Study characteristics: published document, type of publication, funding source, multidisciplinary authorship, judgment of senior author's knowledge of the area, gender of authors, affiliation of authors, geographic location of study, decade in which study was published.
3. Study sample characteristics: age, gender, race, urban/rural, SES, risk level, crime history, psychological make-up.
4. Study methodology: extreme groups design, attrition, follow-up length, type of outcome measure, sample size, statistical value.

The accuracy of coding was assessed using the index: agreement = number of agreements ÷ (number of agreements + number of disagreements) (Yeaton and Wortman, 1993). The second author coded all studies. The first author blindly coded a random sample of 30 studies. Percentage agreement scores for the two raters ranged from 85% to 98% across coding categories. Where disagreements occurred, the coding used was based on the first author's classification.

PREDICTOR CATEGORIES

The predictors were initially sorted into 18 domains (Category I). The coding criteria are detailed in the appendix. Then, for the purposes of research synthesis, the 18 domains were collapsed into 8 all-encompassing predictor domains (Category II): (1) age/gender/race, (2) criminal history, (3) criminogenic needs, (4) family factors, (5) intellectual functioning, (6) personal distress, (7) SES, and (8) social achievement.

EFFECT SIZE CALCULATION

Pearson product-moment correlation coefficients were produced for all predictors in each study that reported a numerical relationship with the criterion. When statistics other than Pearson *r* were presented, they were converted to *r* using the appropriate statistical formulas (Rosenthal, 1991). Where a *p* value of greater than .05 was the only reported statistic, an *r* of .0 was assigned.

Next, the obtained correlations were transformed using Fisher's table. Then, according to the procedures outlined by Hedges and Olkin (1985:230–232), the statistic z^+, representing the weighted estimation of Pearson *r*, was calculated for each predictor domain by dividing the sum of

the weighted z_rs per predictor domain by dividing the sum of each predictor's sample size minus three across that domain.

In order to determine the practical utility of various predictors relative to each other, the common language (CL) effect size indicator (McGraw and Wong, 1992) was also employed. The CL measure is little affected by changes in base rates and selection ratios, which makes it ideal for prediction studies (Rice and Harris, 1995). The CL statistic converts an effect size into the probability that a predictor-criterion score sampled at random from the distribution of one predictor domain (e.g., criminogenic needs) will be greater than that sampled from another distribution (e.g., personal distress).

SIGNIFICANCE TESTING

To determine which of the predictor domains predicted criterion significantly different from zero, the mean z^+ values for each domain were multiplied by the value of $(N - 3k)^{1/2}$, where N = the number of subjects per predictor domain and k = the number of predictors per domain (Hedges and Olkin, 1985).

One-way ANOVAs and the Student–Newman–Keuls (SNK) multiple comparison test were then applied to the mean r values of those domains that significantly predicted criterion better than zero in order to assess which domains differed significantly from each other.

Mindful of the debate regarding alternatives to the use of parametric methods as tests of significance in meta-analyses, the mean z^+ values for significant predictor domains were also assessed using an analog to the ANOVA's F test, the goodness-of-fit statistic Q (Hedges and Olkin, 1985). Following that, post hoc comparisons of the differences between mean z^+ values of each pair of significant predictor domains were conducted using the z test (E. Marchand, personal communication, June 15, 1994).

Finally, one-way ANOVAs and the SNK test using Pearson r were employed to assess whether type of outcome criteria, length of follow-up, and study characteristics were related to effect size.

The CL statistic does not involve significance testing.

Unless otherwise specified, alpha was set at .05 two-tail for all significance tests.

RESULTS

We identified 131 studies as suitable for the meta-analysis. These studies generated 1,141 effect sizes with future criminal behavior.

For those variables for which at least 60% of the studies reported information on the study characteristics sampled, the results were as follows: (1) 86% of the studies were published, 58% in journals; (2) 73% of the

senior authors had published in the area previously, 51% of them were male; (3) 44% and 54% of authors were based in an academic or government agency setting, respectively; (4) the studies were evenly distributed across the decades and the majority emanated from the United States and Canada, although Canadian studies contributed the majority (63%) of effect sizes; (5) 95% of studies consisted of male or mixed samples; (6) only 5% of studies employed an extreme groups design; and (7) 83% did not suffer subject attrition of more than 10% of their sample.

PREDICTOR DOMAINS: CATEGORY I

Table 1 presents the mean effect sizes for the 18 levels of Category I in conjunction with the number of effect sizes (k) and the total number of subjects associated with each predictor domain (N). The domains are grouped as follows: static (n = 10), dynamic (n = 7), and composite measures (n = 1).

The following is an example of how to read Table 1. Across the 131 studies sampled, a quantitative relationship between the predictor age and recidivism was reported on 56 occasions and involved a total of 61,312 subjects. The associated mean Pearson r for age with outcome was .15 (S.D. = .12), with younger age being positively correlated with poorer outcome. Mean z^+, the weighted estimation of Pearson r for age with outcome, was .11. Application of Hedges and Olkin's (1985) method for testing the significance of the mean z^+ values confirmed age as a significant predictor of recidivism.

All predictor domains were significant predictors of recidivism. The largest mean r values were found for adult criminal history, antisocial personality, companions, and criminogenic needs. Risk scale measures, which contained information from several predictor domains, produced the highest mean r value with recidivism (.30).

The conclusions reached by the parametric (ANOVA, SNK) statistical analysis were virtually identical to those of the F-test analog (Q, Z-test comparison). We report the results of the standard parametric analysis.

A one-way ANOVA applied to the mean r values (excluding composite risk scales) indicated there was a significant difference across the predictor domains [$F(16, 1001) = 5.59$]. An SNK multiple comparison test of the mean r values is specified in Table 1. Adult criminal history and criminogenic needs produced the greatest frequency of significant differences. Each of these was significantly different from family structure, intellectual functioning, personal distress, and SES.

PREDICTOR DOMAINS: CATEGORY II

With the exception of the risk scales domain, the predictor domains

Table 1. Mean Effect Sizes for Predictor Domains: Category I

Predictor (k)	N	$M\ r$	$M\ z^+$
Static[a]			
1. Age (56)	61,312	.15(.12)[b]	.11*
2. Criminal History: Adult (164)	123,940	.18(.13)[c]	.17*
3. History of Antisocial Behavior: Preadult (119)	48,338	.13(.13)[b]	.16*
4. Family Criminality (35)	32,546	.12(.08)	.07*
5. Family Rearing Practices (31)	15,223	.15(.17)[b]	.14*
6. Family Structure (41)	24,231	.10(.08)	.09*
7. Gender (17)	62,021	.10(.07)	.06*
8. Intellectual Functioning (32)	21,369	.07(.14)	.07*
9. Race (21)	56,727	.13(.15)	.17*
10. SES (23)	13,080	.06(.11)	.05*
Dynamic[a]			
11. Antisocial Personality (63)	13,469	.18(.12)[d]	.18*
12. Companions (27)	11,962	.18(.08)[e]	.21*
13. Criminogenic Needs (67)	19,809	.18(.10)[c]	.18*
14. Interpersonal Conflict (28)	12,756	.15(.10)[b]	.12*
15. Personal Distress (66)	19,933	.05(.15)	.05*
16. Social Achievement (168)	92,662	.15(.14)[e]	.13*
17. Substance Abuse (60)	54,838	.14(.12)[b]	.10*
Composite Measures			
18. Risk Scales (123)	57,811	.30(.14)	.30*

NOTES: k = effect sizes per predictor domain; N = subjects per predictor domain; $M\ r$ = mean Pearson r (S.D.); $M\ z^+ = \Sigma\ [(z_r) \times (n - 3)] \div \Sigma\ [(n - 3)]$, where n = number of subjects per effect size.

[a] $M\ r$: $F\ (16, 1001) = 5.59$, $p < .05$.

[b] 1, 3, 5, 14, 17 vs. 15; SNK post hoc comparison, $p < .05$.

[c] 2, 13 vs. 6, 8, 10, 15; SNK post hoc comparison, $p < .05$.

[d] 11 vs. 8, 10, 15; SNK post hoc comparison, $p < .05$.

[e] 12, 16 vs. 8, 15;SNK post hoc comparison, $p < .05$.

* $p < .05$.

from Category I were collapsed into 8 groups (see Table 2). All predictor domains were significantly greater than 0. There were significant differences among the 8 predictor domains [$F(7, 1010) = 10.00$]. The SNK multiple comparison test of the mean r values revealed that the predictor domains criminal history and criminogenic needs were significantly greater than those of family factors, intellectual functioning, personal distress, and SES.

Table 2. Mean Effect Sizes for Predictor Domains: Category II

Predictor (k)	N	$M\ r$	$M\ z^+$
Static[a]			
1. Age/Gender/Race (94)	180,060	.14(.12)[b]	.11*
2. Criminal History[c] (282)	171,159	.16(.13)[d]	.16*
3. Family Factors (107)	72,000	.12(.12)[b]	.08*
4. Intellectual Functioning (32)	21,369	.07(.14)	.07*
5. SES (23)	13,080	.06(.11)	.07*
Dynamic[a]			
6. Criminogenic Need Factors[e] (246)	113,153	.17(.11)[d]	.14*
7. Personal Distress (66)	19,933	.06(.15)	.05*
8. Social Achievement (168)	92,662	.15(.14)[f]	.13*
Static versus Dynamic[g]			
9. Static (536)	457,552	.12(.14)	.11*
10. Dynamic (482)	226,664	.15(.13)	.13*

NOTES: k = effect sizes per predictor domain; N = subjects per predictor domain; $M\ r$ = mean Pearson r (S.D.); $M\ z^+ = \Sigma\ [(z_r) \times (n - 3)] \div \Sigma\ [(n - 3)]$, where n = number of subjects per effect size.

[a] $M\ r$: $F\ (7, 1010) = 10.00$, $p < .05$.

[b] 1, 3 vs. 4, 7; SNK post hoc comparison, $p < .05$.

[c] Criminal history = adult plus preadult.

[d] 2, 6 vs. 3, 4, 5, 7; SNK post hoc comparison, $p < .05$.

[e] Criminogenic need factors = antisocial personality, companions, interpersonal conflict, criminogenic needs, and substance abuse.

[f] 8 vs. 4, 5, 7; SNK post hoc comparison, $p < .05$.

[g] $M\ r$: $F\ (1, 1016) = 6.18$, $p < .05$.

* $p < .05$.

The eight predictor domains were classified into dynamic and static factors. The dynamic grouping consisted of criminogenic needs factors, personal distress, and social achievement. The mean r values for dynamic (.15) and static (.12) were significantly different [$F(1, 1016) = 6.18$].

The CL effect size indicator provided another approach to examining the relative usefulness of the eight predictor domains from Table 2 as well as the static-dynamic comparison. The CL scores, summarized in Table 3, indicate the percentage of time that one of a pair of predictors produced larger correlations with outcome.

Table 3 can be read in the following way. With regard to direction, unbracketed scores favor the horizontal axis predictor while bracketed

Table 3. Common Language Effect Size Indicators

	CH	CN	F	I	PD	SES	SA
AGR	[54]	[58]	54	64	66	68	[53]
CH	—	[52]	58	68	69	71	51
CN		—	62	71	73	75	54
F			—	61	63	64	[57]
I				—	52	51	[66]
PD					—	[52]	[68]
SES						—	[70]

NOTES: Common language effect size indicators for mean *r* values. Bracketed Values favor vertical axis; unbracketed values favor horizontal axis. AGR = age, gender, race; CH = criminal history/history of antisocial behavior; CN = criminogenic need factors; F = family factors; I = intellectual functioning; PD = personal distress; SES = socioeconomic status or social class of origin; SA = social achievement.

scores favor the vertical axis predictor. For example, in comparing criminogenic needs (CN) with personal distress (PD), one can see that 73% of the time CN produced higher correlations with recidivism than did PD.

In the case of the static-dynamic comparison (Table 2), the CL score was 54% in favor of the dynamic predictor domain.

ACTUARIAL MEASURES

Table 4 summarizes the mean effect sizes of the composite risk and personality scales with recidivism. All of the instruments predicted recidivism significantly different from zero. Amongst the risk scales, the LSI-R produced the highest correlation with recidivism (r = .35), but it was not significantly greater than the SFS, Wisconsin, or Other risk scale domains [$F(3, 119) = 1.52$]. The Other domain consisted of SFS clones, that is, instruments containing about 5 to 10 items, almost all of which were static in nature.

The LSI-R produced CL scores of 76% and 67% with the Wisconsin and SFS, respectively, when mean r was the dependent variable.

A comparison of the mean r values associated with the antisocial personality measures revealed a significant difference between measures [$F(2, 59) = 4.01$]. The SNK multiple comparison test reported that the PCL was a significantly better predictor than either the MMPI-based measures or Other domain.

The CL analysis indicated that 83% of the time the PCL produced

larger Pearson *r* correlations with recidivism than did the MMPI.[2]

DISCUSSION AND RECOMMENDATIONS

Prior to discussing the results it must be noted that the generalization of the results of any meta-analysis is limited by the nature of the studies examined.

Some valuable studies (e.g., Gendreau et al., 1979a) could not be used because the researchers reported their results in formats (e.g., regression analyses) from which Pearson *r*s could not be calculated. In addition, little attempt was made to retrieve unpublished studies that were not immediately available. A common assumption is that one of the reasons some

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2. As a result of collecting the literature and analyzing the data, some other comparisons came to light that merited closer examination.

Personal Distress: Within the personal distress domain, 24 of 66 effect sizes tapped the psychiatric symptomatology dimension through items such as schizophrenia, psychosis, and prior psychiatric history. The mean *r* (S.D.) for this subset with recidivism was .00 (.17).

Family Factors: Our analysis of family factors did not include studies from the gene-crime relationship because Walters (1992) has already conducted a thorough meta-analysis in this area. He reported small correlations between genetic background and criminal behavior. We determined whether, in fact, genetic background predicted criterion significantly greater than 0. Only those studies that were twin and adoption studies (the most stringent comparison of the gene-crime relationship) and used an official measure of outcome were assessed. Fifteen effect sizes from Tables 2 and 3 of Walter's (1992) study were generated and analyzed using the Hedges and Olkin (1985) formulas. The mean *r* with recidivism was .08. The z^+ was also .08, indicating that genetic background was a significant predictor of recidivism.

Measuring Change: Andrews and Bonta (1994) and Bonta (1996) have stressed the importance of measuring change with dynamic predictors. Six studies were located that assessed offenders at two points in time and derived a change score, which was then correlated with future recidivism. A meta-analysis of their results was not possible because five of the six studies did not report data in a suitable form or had very small cell frequencies. The following narrative will have to suffice.

Recidivism rates changed between 30% and 50% when an offender's status moved from high to low risk or vice versa (Motiuk et al., 1986; Motiuk, 1991). Change scores predicted recidivism as well as measures taken at either entry to prison or prior to release (Gendreau et al., 1979b). The effect size for change scores may be quite substantial. Data from Table 3 of Bonta (1996) were recalculated (for the low-high/high-low cells) yielding a X^2 (1, N = 808) = 116.41, which is equivalent to an *r* of .38.

Type of Outcome: While the issue is rarely, if ever, raised in the research literature, one is occasionally asked by practitioners which official measure of recidivism is the most sensitive. Four criteria—arrest, conviction, incarceration, and parole violation—were compared as to differences in mean effect size, where values ranged from .13 to .19. There was a significant difference among the mean values [F(3, 894) = 6.71]. The SNK multiple comparison test reported that the mean *r* values associated with incarceration were significantly greater than those of conviction or parole violation. The CL scores for the four outcome indices were calculated. In all comparisons, however, the CL scores were less than 60%.

Table 4. Mean Effect Sizes for Risk and Antisocial Personality Scales

Predictor (k)	N	$M\ r$	$M\ z^+$
Risk Scales[a]			
1. LSI-R (28)	4,579	.35(.08)	.33*
2. SFS (15)	9,850	.29(.10)	.26*
3. Wisconsin (14)	14,092	.27(.08)	.32*
4. Other (66)	29,290	.30(.17)	.30*
Antisocial Personality Scales[b]			
5. MMPI Based (16)	3,420	.16(.09)	.21*
6. PCL (9)	1,040	.28(.09)[c]	.29*
7. Other (37)	8,875	.16(.13)	.16*

NOTES: k = effect sizes per predictor domain; N = subjects per predictor domain; $M\ r$ = mean Pearson r (S.D.); $M\ z^+ = \Sigma\ [(z_r) \times (n - 3)] \div \Sigma\ [(n - 3)]$, where n = number of subjects per effect size.

[a] $M\ r$: $F\ (3, 119) = 1.52$, $p > .05$.

[b] $M\ r$: $F\ (2, 59) = 4.01$, $p < .05$.

[c] 6 vs. 5, 7; Student–Newman–Keuls post hoc comparison, $p < .05$.

* $p < .05$.

studies are not published is that they lack methodological rigor, which in turn, affects the magnitude of effect sizes (see Lipsey and Wilson, 1993). Lipsey and Wilson's (1993) analysis applied to treatment studies, but so far, prediction studies have not shown similar results (Goggin and Gendreau, 1995).

Another methodological point concerns one of the goals of meta-analysis. Hunter and Schmidt (1990) are interested in determining the maximum value that can be obtained in prediction if all variables are perfectly measured. Others insist that the goal of meta-analysis is to "teach us better what *is*, not what might some day be in the best of all possible worlds . . ." (italics added; Rosenthal, 1991:25). We are of the latter view and did not attempt to adjust statistically for methodological artifacts, which may or may not have had an impact on the magnitude of the effect sizes obtained.

The data base was, regrettably, virtually silent on the prediction of recidivism among female offenders, minority groups, white-collar offenders, and some important sample characteristics, such as risk level and the psychological make-up of the subjects studied. Much of the effect size data on dynamic predictor domains came from Canada, where there has been a strong emphasis on the assessment of individual differences (Andrews and Bonta, 1994).

One should not assume that many of the correlations found in this meta-analysis (e.g., .10 — .30) are inconsequential. In fact, mean *r* values in this range can be indicative of substantial practical import (Hunter and Schmidt, 1990; Rosnow and Rosenthal, 1993). Indeed, the percentage improvement in predicting recidivism can equal the value of *r*, assuming base rates and selection ratios that are not in the extreme (Rosenthal, 1991:134).

The fact that the data base consisted of just over 1,000 effect sizes involving almost 750,000 subjects suggests that reasonable confidence can be placed in the results. Additional research, in our view, is not likely to change the direction or ordering of the results of the predictor domains to any marked degree.

The remainder of this discussion addresses the questions raised in the introduction.

PREDICTOR DOMAINS

The meta-analysis provided further confirmation of the narrative reviews, which concluded that variables such as age, criminal history, companions, family factors, gender, social achievement, and substance abuse are significant and potent predictors of recidivism. On the other hand, it offered some important insights into several other predictor domains.

The time is long past when those offender risk factors that are dynamic in nature can be cavalierly ignored. Indeed, criminogenic needs produced higher correlations with recidivism (see Table 3) a much higher percentage of the time than did several other predictor domains. When considering all predictor domains, a statistically significant difference was found in favor of dynamic risk factors, but the CL effect size indicator was only 54%. Moreover, the two major static and dynamic categories, criminal history and criminogenic needs, were almost identical in predicting recidivism. While very few studies have assessed how well changes over time within dynamic factors predict recidivism, the data suggest that changes in criminogenic needs may produce strong correlations in that regard.

Early family factors and history of preadult antisocial behavior are rarely included in adult offender risk prediction instruments.[3] Fortuitously, a number of estimable studies (producing 103 effect sizes) were located that followed offenders from early years to adulthood. The combined family factors domain (Table 2) and preadult history of antisocial behavior (Table 1) produced correlations of .12 and .13 with recidivism,

3. Typically, risk prediction instruments for adults assess just one aspect of this predictor domain and employ one or two items in so doing. For example, the LSI-R has one item (no. 5) in this regard (i.e., "arrested under age 16").

respectively, demonstrating once again that antisocial risk factors in childhood can have far-reaching influence (e.g., Stattin and Magnusson, 1989).

Much controversy has focused upon how well personal distress, intelligence, and SES predict recidivism (Andrews and Bonta, 1994; Herrnstein and Murray, 1994; Tittle and Meier, 1990). From a treatment standpoint, the important result centered on the fact that personal distress turned out to be quite a weak predictor of recidivism. Moreover, one of the components of this domain, psychiatric symptomatology, which has characteristically been perceived as an important predictor of reoffending in the field of psychiatry (Phillips et al., 1988), did not correlate (r = .00) with recidivism. This finding was based on few effect sizes; more research is needed to confirm this tentative result. It would be reasonable, therefore, to assume that programs that insist on alleviating offenders' personal distress, as many do (Gendreau et al., 1994), will have little success in reducing offender recidivism. Meta-analyses of the offender treatment literature (e.g., Andrews et al., 1990b) are also supportive of this conclusion.

The studies in the meta-analysis that included measures of IQ were of the "traditional" sort, that is, standard paper and pencil tests that measured linguistic and mathematical abilities. Although these sorts of IQ measures can produce modest correlations with criminal behavior over long periods of time (Moffitt et al., 1994), it is generally agreed that this type of IQ assessment has reached its limits (Gardner, 1995). A much more productive strategy would be to focus on what is called practical or tacit intelligence, which is defined as the ability to learn and profit from experience, effectively monitor one's own and other's feelings and needs, and solve the problems of everyday life (Gardner, 1983; Sternberg et al., 1995).

This meta-analysis extended Tittle and Meier's (1990, 1991) pessimistic conclusions regarding the social class-crime link with delinquent samples to that of adult offenders. It is difficult to judge how social class theories will evolve in the future; for speculations on this matter see Andrews and Bonta (1994) and Tittle and Meier (1990). The most probable scenario is that social class theories will incorporate more psychological concepts (e.g., Agnew, 1992).

How well might the results from the meta-analysis generalize to specialized offender groups? Few violence prediction studies that predicted the occurrence of violence versus no criminal activity were retrieved. Our reading of the literature indicates that the strongest predictors identified in this meta-analysis also apply to violent offenders (Harris et al., 1993; Reiss and Roth, 1993). As well, composite measures of general recidivism (i.e., LSI-R) correlate highly (r = .78) with measures intended to predict violence (i.e., PCL-R) (Loza and Simourd, 1994). One area in which the predictors of violent offending may be quite different is that of impulsivity

combined with overly hostile attributions of other people's intent (Serin and Kuriychuk, 1994). Sex offenders present a somewhat different picture. At the risk of generalizing across such a complex group, there do appear to be a few predictors, centering on the offense itself, that are unique to this population (Hanson and Bussière, 1995).

In regard to theory development, the results from the meta-analysis are most supportive of recent advancements in differential association and social learning theories (see Andrews and Bonta, 1994:104–124). These authors assert that it is absolutely essential that criminogenic needs and antisocial associates are two of the strongest correlates of criminal conduct. Criminogenic needs establish the standards of conduct and generate the rationale for engaging in antisocial behavior. Antisocial associates provide the opportunity for antisocial modeling to occur, govern the rewards and costs of such behavior, and influence antisocial attitudes.

The less potent predictors in this meta-analysis (e.g., SES, personal distress, intellectual functioning) have traditionally been associated with the anomie/strain and subcultural theories and biologically oriented theories.

ACTUARIAL MEASURES FOR PREDICTING RECIDIVISM

Composite measures of risk, on average, produced substantially greater correlations with recidivism than antisocial personality scales. This is not surprising, because risk measures generally sample from a much wider variety of predictor domains than personality scales.

Among the former, the LSI-R produced higher correlations with recidivism than the SFS, the Wisconsin, or the Other category. While the mean differences among the four measures were not statistically significant,[4] the CL effect size indicator provided a result of practical importance. The LSI-R produced larger correlations with recidivism than did the three other risk measures between 62% and 76% of the time. The LSI-R, therefore, appears to be the current measure of choice. An impressive number of studies confirming its predictive validity with recidivism and prison adjustment have been generated for a variety of offender populations (i.e., adults, juveniles, natives, females) (Andrews and Bonta, 1995).

In the area of antisocial personality assessment, a noteworthy finding was that Hare's (1991) PCL-R produced significantly greater correlations with recidivism than the widely used MMPI-based systems. The PCL-R specializes in assessing the psychopathic dimension of antisocial personality. It is recommended by clinicians who are concerned with predicting violence (Harris et al., 1993).

4. See J. Cohen (1994) and Schmidt (1992) for a criticism of the use of standard significance testing, which they claim, often results in Type II errors and a failure to account for a realistic estimate of the magnitude of the effect sizes under study.

CONCLUSION AND RECOMMENDATIONS

In conclusion, the modest contribution from this meta-analysis has been to clarify which predictor domains and actuarial measures of risk will be most useful to practitioners and policymakers. In regard to the assessment of static predictors, protocols should contain any reliable information that accurately captures early family life and social adjustment risk factors. Dynamic risk factors, particularly those of criminogenic needs, must be included and reassessed over time. The choice of criterion (e.g., reconviction) should depend on the goals of the assessment. Of the available risk measures, the LSI-R is recommended. In the case of specialized offender populations, additional measures (e.g., PCL-R) might be used in conjunction with a general measure of risk.

REFERENCES

Agnew, Robert
1992 Foundation for a general strain theory of crime and delinquency. Criminology 30:47–86.

Andrews, D.A. and James Bonta
1994 The Psychology of Criminal Conduct. Cincinnati, Ohio: Anderson.
1995 LSI-R: The Level of Service Inventory - Revised. Toronto, Ont.: Multi-Health Systems, Inc.

Andrews, D.A. and J. Stephen Wormith
1989 Personality and crime: Knowledge destruction and construction in criminology. Justice Quarterly 6:289–309.

Andrews, D.A., James Bonta, and Robert D. Hoge
1990a Classification for effective rehabilitation: Rediscovering psychology. Criminal Justice and Behavior 17: 19–52.

Andrews, D.A. Ivan Zinger, Robert D. Hoge, James Bonta, Paul Gendreau, and Francis T. Cullen
1990b Does correctional treatment work? A psychologically informed meta-analysis. Criminology 28:369–404.

Baird, Christopher S.
1981 Probation and parole classification: The Wisconsin model. Corrections Today 43:36–41.

Bonta, James
1996 Risk-needs assessment and treatment. In Alan Harland (ed.), Choosing Correctional Options that Work: Defining the Demand and Evaluating the Supply. Thousand Oaks, Calif.: Sage.

Bonta, James and Paul Gendreau
1990 Reexamining the cruel and unusual punishment of prison life. Law and Human Behavior 14:347–372.

Clear, Todd R. and Kenneth W. Gallagher
1985 Probation and parole supervision: A review of current classification. Crime and Delinquency 31:423–443.

Cohen, Albert K.
1955 Delinquent Boys: The Culture of the Gang. Glencoe, Ill.: Free Press.

Cohen, Jacob
1994 The earth is round ($p < .05$). American Psychologist 49:997–1003.

Cooper, Harris and Larry V. Hedges
1994 Handbook of Research Synthesis. New York: Russell Sage Foundation.

Cronbach, Lee J.
1990 Essentials of Psychological Testing. New York: HarperCollins.

Feeley, Malcolm M. and Jonathon Simon
1992 The new penology: Notes on the emerging strategy of corrections and its implications. Criminology 30:449–474.

Gardner, Howard
1983 Frames of Mind: The Theory of Multiple Intelligence. New York: Basic Books.
1995 Cracking open the IQ box. The American Prospect 20:71–80.

Gendreau, Paul
1996 Offender rehabilitation: What we know and what needs to be done. Criminal Justice and Behavior 23:144–161.

Gendreau, Paul and D.A. Andrews
1990 Tertiary prevention: What the meta-analysis of the offender treatment literature tells us about "what works." Canadian Journal of Criminology 32:173–184.

Gendreau, Paul and Robert R. Ross
1987 Revivification of rehabilitation: Evidence from the 80's. Justice Quarterly 4:349–407.

Gendreau, Paul, Brian A. Grant, Mary Leipciger, and Steven Collins
1979a Norms and recidivism rates for the MMPI and selected experimental scales on a Canadian delinquent sample. Canadian Journal of Behavioural Science 11:21–31.

Gendreau, Paul, Brian A. Grant, and Mary Leipciger
1979b Self-esteem, incarceration and recidivism. Criminal Justice and Behavior 6:67–75.

Gendreau, Paul, Claire Goggin, and Helen Annis
1990 Survey of existing substance abuse programs. Forum on Corrections Research 2:6–8.

Gendreau, Paul, D.A. Andrews, Claire Goggin, and Françoise Chanteloupe
1992 The Development of Clinical and Policy Guidelines for the Prediction of Criminal Behaviour in Criminal Justice Settings. Ministry Secretariat, User Report. Ottawa, Ont.: Solicitor General of Canada.

Gendreau, Paul, Francis T. Cullen, and James Bonta
1994 Intensive rehabilitation supervision: The next generation in community corrections? Federal Probation 58:72–78.

Goddard, Henry Herbert
1920 Human Efficiency and Levels of Intelligence. Princeton, N.J.: Princeton University Press.

Goggin, Claire E. and Paul Gendreau
1995 Predicting psychiatric rehospitalization: A meta-analysis. Unpublished manuscript, University of New Brunswick, Saint John, N.B., Canada.

Gough, Harrison G.
1957 Manual for the California Psychological Inventory. Palo Alto, Calif.: Consulting Psychologists Press.

Gough, Harrison G., E.A. Wenk, and V.V. Rozynko
1965 Parole outcome as predicted from the CPI, the MMPI, and a Base Expectancy Table. Journal of Abnormal Psychology 70:432–441.

Hanson, R. Karl and Monique Bussière
1995 Predictors of sexual offender recidivism. Ministry Secretariat. Ottawa, Ont.: Solicitor General of Canada.

Hare, Robert D.
1991 The Revised Psychopathy Checklist. Toronto: Multi-Health Systems.

Harris, Grant T., Marnie E. Rice, and Vernon L. Quinsey
1993 Violent recidivism of mentally disordered offenders: The development of a statistical prediction instrument. Criminal Justice and Behavior 20:315–335.

Hedges, Larry V. and Ingram Olkin
1985 Statistical Methods for Meta-Analysis. San Diego, Calif.: Academic Press.

Herrnstein, Richard J. and Charles A. Murray
1994 The Bell Curve: Intelligence and Class Structure in American Life. New York: Free Press.

Hirschi, Travis and Michael J. Hindelang
1977 Intelligence and delinquency: A revisionist review. American Sociological Review 42:571–587.

Hoffman, Peter B.
1983 Screening for risk: A revised salient factor score (SFS 81). Journal of Criminal Justice 11:539–547.

Hoge, Robert D., Alan W. Leschied, and D.A. Andrews
1993 An Investigation of Young Offender Services in the Province of Ontario: A Report of the Repeat Offender Project. Toronto, Ont.: Ontario Ministry of Community and Social Services.

Hunter, John E. and Frank L. Schmidt
1990 Methods of Meta-Analysis: Correcting Error and Bias in Research Findings. Newbury Park, Calif.: Sage.

Jones, Peter R.
1996 Risk prediction in criminal justice. In Alan T. Harland (ed.), Choosing Correctional Options that Work: Defining the Demand and Evaluating the Supply. Thousand Oaks, Calif.: Sage.

Kaminer, Wendy
1992 I'm Dysfunctional - You're Dysfunctional. New York: Addison–Wesley.

LeBlanc, Marc, Marcel Ouimet, and Richard E. Tremblay
1988 An integrative control theory of delinquent behaviour: A validation 1976–1985. Psychiatry 51:164–176.

Lipsey, Mark W.
1992 Juvenile delinquency treatment: A meta-analytic inquiry into the variability of effects. In T.D. Cook, H. Cooper, D.S. Cordray, H. Hartmann, Larry V. Hedges, R.J. Light, T.A. Louis, and F. Mosteller (eds.), Meta-analysis for Explanation. New York: Russell Sage Foundation.

Lipsey, Mark W. and David B. Wilson
1993 The efficacy of psychological, educational, and behavioral treatment: Confirmation from meta-analysis. American Psychologist 48:1181–1209.

Little, Kenneth B. and Edwin S. Shneidman
1959 Congruencies among interpretations of psychological test and anamnestic data. Psychological Monographs: General and Applied 73:1–42.

Loza, Wagdy and David J. Simourd
1994 Psychometric evaluation of the Level of Supervision Inventory (LSI-R) among male Canadian federal offenders. Criminal Justice and Behavior 21:468–480.

Matza, David
1964 Delinquency and Drift. 2d ed. New York: John A. Wiley & Sons.

Mauer, Marc
1994 Americans behind bars: The international use of incarceration, 1992–1993. Washington, D.C.: Sentencing Project.

McGraw, Kenneth O. and S.P. Wong
1992 A common language effect size. Psychological Bulletin 111:361–365.

Meehl, Paul E.
1954 Clinical Versus Statistical Prediction. Minneapolis: University of Minnesota Press.

Merton, Robert K.
1957 Social Theory and Social Structure. New York: Free Press.

Moffitt, Terrie E., Donald R. Lynam, and Phil A. Silva
1994 Neuropsychological tests predicting persistent male delinquency. Criminology 32:277–300.

Motiuk, Laurence L.
1991 Antecedents and consequences of prison adjustment: A systematic assessment and reassessment approach. Unpublished doctoral dissertation, Carleton University, Ottawa, Ontario, Canada.
1993 Where are we in our ability to assess risk? Forum on Corrections Research 5:14–19.

Motiuk, Laurence L., James Bonta, and D.A. Andrews
1986 Dynamic predictive criterion validity in offender assessment. Paper presented at the June meeting of the Canadian Psychological Association, Ottawa, Ontario, Canada.

Phillips, Michael R., Aron S. Wolf, and David J. Coons
1988 Psychiatry and the criminal justice system: Testing the myths. American Journal of Psychiatry 145:605–610.

Reiss, Albert J., Jr. and Jeffrey A. Roth
1993 Understanding and Preventing Violence. Washington, D.C.: National Academy Press.

Rice, Marnie E. and Grant T. Harris
1995 Violent recidivism: Assessing predictive validity. Journal of Consulting and Clinical Psychology 63:737–748.

Rosenthal, Robert
1991 Meta-Analytic Procedures for Social Research. Newbury Park, Calif.: Sage.

Rosnow, Robert L. and Robert Rosenthal
1993 Beginning Behavioral Research: A Conceptual Primer. New York: Macmillan.

Rowe, David C. and D. Wayne Osgood
1984 Heredity and sociological theories of delinquency: A reconsideration. American Sociological Review 49:526–540.

Schmidt, Frank L.
1992 What do data really mean? American Psychologist 47:1173–1181.

Serin, Ralph C. and Morris Kuriychuk
1994 Social and cognitive processing deficits in violent offenders. International Journal of Law and Psychiatry 17:431–441.

Serin, Ralph C., Ray D. Peters, and Howard E. Barbaree
1990 Predictors of psychopathy and release outcome in a criminal population. Psychological Assessment: A Journal of Consulting and Clinical Psychology 2:419–422.

Simourd, David J., James Bonta, D.A. Andrews, and Robert D. Hoge
1991 Criterion validity of assessments of psychopathy: A meta-analysis. Unpublished manuscript, Carleton University, Ottawa, Ontario, Canada.

Stattin, Håkan and David Magnusson
1989 The role of early aggressive behaviour in the frequency, seriousness and types of later crime. Journal of Consulting and Clinical Psychology 57:710–718.

Sternberg, Robert J., Richard K. Wagner, Wendy M. Williams, and Joseph A. Horvath
1995 Testing common sense. American Psychologist 50:912–926.

Tittle, Charles R. and Robert F. Meier
1990 Specifying the SES/delinquency relationship. Criminology 28:271–299.
1991 Specifying the SES/delinquency relationship by social characteristics of contexts. Journal of Research in Crime and Delinquency 28:430–455.

Walters, Glenn D.
1992 A meta-analysis of the gene-crime relationship. Criminology 30:595–613.

Widom, Cathy S. and Hans Toch
1993 The contribution of psychology to criminal justice education. Journal of Criminal Justice Education 4:251–272.

Wilson, James Q. and Richard J. Herrnstein
1985 Crime and Human Nature. New York: Simon & Schuster.

Yeaton, William H. and Paul M. Wortman
1993 On the reliability of meta-analytic reviews: The role of intercoder agreement. Evaluation Review 17:292–309.

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APPENDIX

CODING CRITERIA FOR PREDICTOR DOMAINS: CATEGORY I

STATIC PREDICTORS

1. Age: at time of data collection/assessment.
2. Criminal history: adult-prior arrest, probation, jail, conviction, incarceration, prison misconducts.
3. History of antisocial behavior: preadult—prior arrest, probation, jail, conviction, incarceration, alcohol/drug abuse, aggressive behavior, conduct disorder, behavior problems at home and school, delinquent friends.
4. Family criminality: parents and/or siblings in trouble with the law.
5. Family rearing practices: lack of supervision and affection, conflict, abuse.
6. Family structure: separation from parents, broken home, foster parents.
7. Gender.
8. Intellectual functioning: WAIS/WISC, Raven, Porteous Q score, learning disabilities, reading level.
9. Race: white vs. black/Hispanic/native.
10. Social class of origin: socioeconomic status (SES) of parents (parental occupation, education, or income).

DYNAMIC PREDICTORS

11. Antisocial personality/sociopathy/psychopathy scales: MMPI Pd, Megargee system, EPI-Psychoticism, CPI-Soc, PCL-R, DSM-III personality disorders, any indices of egocentric thinking.
12. Companions: identification/socialization with other offenders.
13. Criminogenic needs: antisocial attitudes supportive of an antisocial lifestyle and behavior regarding education, employment.
14. Interpersonal conflict: family discord, conflict with significant others.
15. Personal distress: anxiety, depression, neuroticism, low self-esteem, psychiatric symptomatology (i.e., psychotic episodes, schizophrenia, not guilty by reason of insanity, affective disorder), attempted suicide, personal inadequacy.
16. Social achievement: marital status, level of education, employment history, income, address changes.
17. Substance abuse: recent history of alcohol/drug abuse.

COMPOSITE MEASURES

18. LSI-R, SFS, Wisconsin, Other risk scales.

BIBLIOGRAPHY OF STUDIES IN THE META-ANALYSIS

Adams, Don and Joel Fischer
1976 The effects of prison residents' community contacts on recidivism rates. Corrective and Social Psychiatry and Journal of Behavioral Technology, Methods, and Therapy 22:21–27.

Andrews, D.A. and Walter Friesen
1987 Assessments of anticriminal plans and the prediction of criminal futures: A research note. Criminal Justice and Behavior 14:33–37.

Andrews, D.A., Jerry J. Kiessling, Susan Mikus, and David Robinson
1986 The construct validity of interview-based risk assessment in corrections. Canadian Journal of Behavioural Science 18:460–470.

Babst, Dean V., Mary Koval, and M.G. Neithercutt
1972 Relationship of time served to parole outcome for different classifications of burglars based on males paroled in fifty jurisdictions in 1968 and 1969. Journal of Research in Crime and Delinquency 9:99–116.

Babst, Dean V., William H. Moseley, James Schmeidler, M.G. Neithercutt, and Mary Koval
1976 Assessing the length of institutionalization in relation to parole outcome. Criminology 14:41–54.

Baker, Laura A., Wendy Mack, Terrie E. Moffitt, and Sarnoff Mednick
1989 Sex differences in property crime in a Danish adoption cohort. Behavior Genetics 19:355–370.

Barbaree, Howard E. and William L. Marshall
1988 Deviant sexual arousal, offense history, and demographic variables as predictors of reoffense among child molesters. Behavioral Sciences and the Law 6:267–280.

Barnett, Arnold, Alfred Blumstein, and David P. Farrington
1989 A prospective test of a criminal career model. Criminology 27:373–388.

Bayer, Betty M., James L. Bonta, and Laurence L. Motiuk
1985 The PD subscales: An empirical evaluation. Journal of Clinical Psychology 41:780–788.

Bennett, Lawrence A.
1974 Self-esteem and parole adjustment. Criminology 12:346–363.

Bieber, Stephen L., Richard A. Pasewark, Katherine Bosten, and Henry J. Steadman
1988 Predicting criminal recidivism of insanity acquittees. International Journal of Law and Psychiatry 11:105–112.

Black, Tony and Penny Spinks
1985 Predicting outcomes of mentally disordered and dangerous offenders. In David P. Farrington and Roger Tarling (eds.), Prediction in Criminology. Albany: State University of New York Press.

Bogenberger, Robert P., Richard A. Pasewark, Howard Gudeman, and Stephen L. Bieber
1987 Follow-up of insanity acquittees in Hawaii. International Journal of Law and Psychiatry 10:283–295.

Bonta, James
1989 Native inmates: Institutional response, risk, and needs. Canadian Journal of Criminology 31:49–61.

Bonta, James and Laurence L. Motiuk
1985 Utilization of an interview-based classification instrument: A study of correctional halfway houses. Criminal Justice and Behavior 12:333–352.
1987 The diversion of incarcerated offenders to correctional halfway houses. Journal of Research in Crime and Delinquency 24:302–323.
1990 Classification to halfway houses: A quasi-experimental evaluation. Criminology 28:497–506.

Bonta, James, Stan Lipinski, and Michael Martin
1992 The characteristics of aboriginal recidivists. Canadian Journal of Criminology 38:517–522.

Broadhurst, Roderick G. and Ross A. Maller
1990 The recidivism of prisoners released for the first time: Reconsidering the effectiveness question. Australian and New Zealand Journal of Criminology 23:88–104.
1991 Sex Offending and Recidivism. Report No. 3. Crime Research Center. Nedlands: The University of Western Australia.

Broadhurst, Roderick G., Ross A. Maller, Maxwell G. Maller, and Jennifer Duffecy
1988 Aboriginal and non-aboriginal recidivism in Western Australia: A failure rate analysis. Journal of Research in Crime and Delinquency 25:83–108.

Brown, Lawrence D.
1978 The development of a parolee classification system using discriminant analysis. Journal of Research in Crime and Delinquency 15:92–108.

Buikhuisen, W. and H.A. Hoekstra
1974 Factors related to recidivism. British Journal of Criminology 14:62–69.

Buikhuisen, W. and B.W.G.P. Meijs
1983 A psychosocial approach to recidivism. In Katherine Teilmann Van Dusen and Sarnoff A. Mednick (eds.), Prospective Studies of Crime and Delinquency. Boston: Kluwer–Nijhoff.

Carlson, Kenneth A.
1973 Some characteristics of recidivists in an Ontario institution for adult male first incarcerates. Canadian Journal of Criminology and Corrections 15:397–409.

Carroll, John S., Richard L. Wiener, Dan Coates, Jolene Galegher, and James J. Alibrio
1982 Evaluation, diagnosis, and predicting in parole decision making. Law & Society Review 17:199–228.

Cloninger, C. Robert and Samuel B. Guze
1973 Psychiatric disorders and criminal recidivism. Archives of General Psychiatry 29:266–269.

Donnelly, Henry C. and Gerald H. Bala
1991 1985 Releases: Five Year Post Release Follow-Up. Albany, N.Y.: Department of Correctional Services.

Eron, Leonard D. and L. Rowell Huesmann
1984 The relation of prosocial behaviour to the development of aggression and psychopathology. Aggressive Behavior 10:201–211.

Farrington, David P.
1983 Offending from 10-25 years of age. In Katherine Teilmann Van Dusen and Sarnoff Mednick (eds.), Prospective Studies of Crime and Delinquency. Boston: Kluwer–Nijhoff.

Farrington, David P., Louise Biron, and Marc LeBlanc
1982 Personality and delinquency in London and Montreal. In John Gunn and David P. Farrington (eds.), Abnormal Offenders, Delinquency, and the Criminal Justice System. New York: John Wiley & Sons.

Farrington, David P., Gwen Gundry, and David J. West
1975 The familial transmission of criminality. Medicine, Science, and the Law 15:177–186.

Feder, Lynette
1991 A comparison of the community adjustment of mentally ill offenders with those from the general prison population: An 18-month follow up. Law and Human Behavior 15:477–493.

Gabrielli, William F. and Sarnoff A. Mednick
1983 Genetic correlates of criminal behaviour. American Behavioral Scientist 27:59–74.

Gendreau, Paul, Brian A. Grant, and Mary Leipciger
1979 Self-esteem, incarceration and recidivism. Criminal Justice and Behavior 6:67–75.

Gendreau, Paul, Patrick Madden, and Mary Leipciger
1979 Norms and recidivism for first incarcerates: Implications for programming. Canadian Journal of Criminology 21:416–441.

Gibbens, T.C.N.
1984 Borstal boys after 25 years. British Journal of Criminology 24:49–62.

Gordon, Alistair M.
1983 Drugs and delinquency: A ten year follow-up of drug clinic patients. British Journal of Psychiatry 142:169–173.

Gottfredson, Michael R. and Don R. Gottfredson
1980 Decision Making in Criminal Justice: Toward the Rational Exercise of Discretion. Cambridge, Mass.: Ballinger.

Gottfredson, Don M., Leslie T. Wilkins, and Peter B. Hoffman
1978 Guidelines for Parole and Sentencing: A Policy Control Method. Lexington, Mass.: D.C. Heath.

Greenberg, William M., Pritesh J. Shah, and Marilyn Seide
1993 Recidivism on an acute psychiatric forensic service. Hospital and Community Psychiatry 44:583–585.

Grygier, Tadeusz, Frank Blum, and O.R. Porebski
1971 Decision and outcome: Studies in parole prediction. Canadian Journal of Criminology and Corrections 13:133–146.

Gunn, J., G. Robertson, S. Dell, and C. Way
1978 Psychiatric Aspects of Imprisonment. London: Academic Press.

Hamparian, Donna
1987 How well can we predict for juveniles? Juvenile delinquency and adult crime. In Fernand N. Dutile and Cleon H. Foust (eds.), The Prediction of Criminal Violence. Chicago: Charles C Thomas.

Hann, Robert G. and William G. Harman
1988 Release risk prediction: Testing the Nuffield scoring system for native and female inmates. Ottawa: Ministry of the Solicitor General of Canada.
1992 Predicting General Release Risk for Canadian Penitentiary Inmates. Ottawa: Corrections Branch of the Ministry of the Solicitor General of Canada.

Hare, Robert D., Leslie M. McPherson, and Adelle E. Forth
1988 Male psychopaths and their criminal careers. Journal of Consulting and Clinical Psychology 56:710–714.

Hart, Stephen D., Philip R. Kropp, and Robert D. Hare
1988 Performance of male psychopaths following conditional release from prison. Journal of Consulting and Clinical Psychology 56:227–232.

Hodgins, Sheilagh
1983 A follow-up study of persons found incompetent to stand trial and/or not guilty by reason of insanity in Quebec. International Journal of Law and Psychiatry 6:399–411.
1987 Men found unfit to stand trial and/or not guilty by reason of insanity: Recidivism. Canadian Journal of Criminology 29:51–70.

Hoffman, Peter B.
1983 Screening for risk: A revised Salient Factor Score (SF81). Journal of Criminal Justice 11:539–547.

Hoffman, Peter B. and James L. Beck
1974 Parole decision-making: A salient factor score. Journal of Criminal Justice 33:195–206.
1976 Salient Factor Score validation: A 1972 release cohort. Journal of Criminal Justice 4:69–76.
1980 Revalidating the Salient Factor Score: A research note. Journal of Criminal Justice 8:185–188.
1984 Burnout-age at release from prison and recidivism. Journal of Criminal Justice 12:617–623.
1985 Recidivism among released federal prisoners: Salient Factor Score and five-year follow-up. Criminal Justice and Behavior 12:501–507.

Hoffman, Peter B., Barbara Stone-Meierhoefer, and James L. Beck
1978 Salient Factor Score and release behaviour: Three validation samples. Law and Human Behavior 2:47–62.

Holcomb, William R. and Paul R. Ahr
1988 Arrest rates among young adult psychiatric patients treated in inpatient and outpatient settings. Hospital and Community Psychiatry 39:52–57.

Holland, Terrill R., Norman Holt, Mario Levi, and Gerald E. Beckett
1983 Comparison and combination of clinical and statistical predictions of recidivism among adult offenders. Journal of Applied Psychology 68:203–211.

Huesmann, L. Rowell, Leonard D. Eron, Monroe M. Lefkowitz, and Leopold O. Walder
1984 Stability of aggression over time and generations. Developmental Psychology 20:1120–1134.

Janes, Cynthia L., Victor M. Hesselbrock, Darcy Gilpin Myers, and Janet H. Peniman
1979 Problem boys in young adulthood: Teacher ratings and twelve-year follow-up. Journal of Youth and Adolescence 8:453–472.

Jenkins, W.O., E.K. deValera, and J.B. Muller
1977 The Behavioral Evaluation Treatment and Analysis (BETA) system in the prediction of criminal and delinquent behavior. Quarterly Journal of Corrections 1:44–50.

Kassebaum, Gene G., David A. Ward, and Daniel Wilner
1971 Prison Treatment and Parole Survival: An Empirical Assessment. Toronto: John Wiley & Sons.

Klein, Stephen P. and Michael N. Caggiano
1986 The Prevalence, Predictability, and Policy Implications of Recidivism. Santa Monica, Calif.: Rand Corporation.

Kolvin, Israel, F.J.W. Miller, M. Fleeting, and P.A. Kolvin
1988 Social and parenting factors affecting criminal-offense rates. British Journal of Psychiatry 152:80–90.

Lambert, Leah R. and Patrick G. Madden
1976 The adult female offender: The road from institution to community life. Canadian Journal of Criminology and Corrections 18:3–15.

Lane, David A.
1987 Personality and antisocial behaviour: A long-term study. Personality and Individual Differences 8:799–806.

LeBlanc, Marc and Marcel Fréchette
1989 Male Criminal Activity from Childhood Through Youth: Multilevel and Developmental Perspectives. New York: Springer–Verlag.

LeBlanc, Marc, Évelyne Vallières, and Pierre McDuff
1993 The prediction of males' adolescent and adult offending from school experience. Canadian Journal of Criminology 25:459–478.

Liberton, Michael, Mitchell Silverman, and William R. Blount
1992 Predicting probation success for the first-time offender. International Journal of Offender Therapy and Comparative Criminology 36:335–347.

Little, Gregory L. and Kenneth D. Robinson
1989 Relationship of DUI recidivism to moral reasoning, sensation seeking, and MacAndrew alcoholism scores. Psychological Reports 65:1171–1174.

Loney, Jan, Mary Anne Whaley-Klahn, Todd Kosier, and Jay Conboy
1983 Hyperactive boys and their brothers at 21: Predictors of aggressive and antisocial outcomes. In Katherine Teilmann Van Dusen and Sarnoff A. Mednick (eds.), Prospective Studies of Crime and Delinquency. Boston: Kluwer–Nijhoff.

Macnaughton–Smith, P.
1976 Permission to be Slightly Free. Ottawa, Ont., Canada: Law Reform Commission of Canada.

McCord, Joan
1982 A longitudinal view of the relationship between paternal absence and crimes. In John Gunn and David Farrington (eds.), Abnormal Offenders, Delinquency, and the Criminal Justice System. Chichester: John Wiley & Sons.
1983 A forty year perspective on effects of child abuse and neglect. Child Abuse and Neglect 7:265–270.

McGarvey, Bill, William F. Gabrielli, Peter M. Bentler, and Sarnoff A. Mednick
1981 Rearing, social class, education, and criminality: A multiple indicator model. Journal of Abnormal Psychology 90:354–364.

McGurk, B.J., N. Bolton, and M. Smith
1978 Some psychological, educational, and criminological variables related to recidivism in delinquent boys. British Journal of Social and Clinical Psychology 17:251–254.

McWilliams, William
1975 Sentencing and recidivism: An analysis by personality type. British Journal of Social Work 5:311–324.

Mednick, Birgitte R., Robert L. Baker, and Linn E. Carothers
1990 Patterns of family instability and crime: The association of timing of the family's disruption with subsequent adolescent and young adult criminality. Journal of Youth and Adolescence 19:201–219.

Mednick, Birgitte R., Charlotte Reznick, Dennis Hocevar, and Robert L. Baker
1987 Long term effects of parental divorce on young adult male crime. Journal of Youth and Adolescence 16:31–45.

Minor, Kevin I. and David J. Hartmann
1992 An evaluation of the Kalamazoo probation enhancement program. Federal Probation 56:30–35.

Mitchell, Sheila and Peter Rosa
1981 Boyhood behaviour problems as precursors of criminality: A fifteen year follow-up study. Journal of Child Psychology and Psychiatry 22:19–33.

Moffitt, Terrie E.
1987 Parental mental disorder and offspring criminal behaviour: An adoption study. Psychiatry 50:346–360.

Moffitt, Terrie E., William F. Gabrielli, Sarnoff A. Mednick, and Fini Schulsinger
1981 Socioeconomic status, IQ, and delinquency. Journal of Abnormal Psychology 90:152–156.

Motiuk, Laurence L.
1991 Antecedents and consequences of prison adjustment: A systematic assessment and reassessment approach. Unpublished doctoral dissertation, Carleton University, Ottawa, Ontario, Canada.

Motiuk, Laurence L. and James M. Bonta
1991 Prediction and matching in corrections: An examination of the risk principle in case classification. Paper presented at the Canadian Psychological Association Annual Convention (June), Calgary, Alberta, Canada.

Motiuk, Laurence L. and Shelley L. Brown
1993 Survival Time until Suspension for Sex Offenders on Conditional Release. Report No. R-31. Research and Statistics Branch. Ottawa: Correctional Service Canada.
1993 The Validity of Offender Needs Identification and Analysis in Community Correction. Report No. R-34. Research and Statistics Branch. Ottawa: Correctional Service Canada.

Motiuk, Laurence L. and Frank J. Porporino
1988 Offender Risk/Needs Assessment: A Study of Conditional Releases. Report No. R-01. Ottawa: Correctional Service of Canada.
1989 Field Test of the Community Risk/Needs Management Scale: A Study of Offenders on Case Load. Report No. R-06. Research Branch, Communications and Corporate Development. Ottawa: Solicitor General Canada/ Correctional Service Canada.

Motiuk, Laurence L., James Bonta, and D.A. Andrews
1986 Classification in correctional halfway houses: The relative and incremental predictive criterion validities of the Megargee-MMPI and LSI-R systems. Criminal Justice and Behavior 13:33–46.

O'Donnell, Clifford R. and Kathleen G. Stanley
1974 An adult furlough center: Correlates of parole success. Journal of Community Psychology 2:83–85.

Pallone, Nathaniel J. and James J. Hennessey
1977 Empirical derivation of a scale for recidivism proneness among parolees: A multivariate model. Offender Rehabilitation 2:95–110.
1977 Some correlates of recidivism among misdemeanants and minor felons: A 12-month follow-up. Journal of Social Psychology 101:321–322.

Payne, Clive, Sarah McCabe, and Nigel Walker
1974 Predicting offender-patients' reconvictions. British Journal of Psychiatry 125:60–64.

Petersén, K. Ingemar, M. Matousek, Sarnoff A. Mednick, Jan Volavka, and V. Pollack
1982 EEG antecedents of thievery. Acta Psychiatrica Scandinavica 65:331–338.

Petersilia, Joan and Susan Turner
1987 Guideline-based justice: Prediction and racial minorities. In Don M. Gottfredson and Michael Tonry (eds.), Prediction and Classification: Criminal Justice Decision Making. Chicago: University of Chicago Press.

Platt, Jerome J. and Christina Labate
1976 Recidivism in youth heroin offenders and characteristics of parole behaviour and environment. International Journal of Addictions 11:651–657.

Porporino, Frank J., Edward Zamble, and Susan Higginbottom
in press Assessing models of predicting risk for criminal recidivism. Journal of Criminal Justice.

Putninš, Aldis L.
1982 The Esyenck Personality questionnaires and delinquency prediction. Personality and Individual Differences 3:339–340.

Quinsey, Vernon L., Manfred Pruesse, and Robert Fernley
1975 Oak Ridge patients: Prerelease characteristics and postrelease adjustment. Journal of Psychiatry and Law 3:63–77.

Rice, Marnie E. and Grant T. Harris
1991 A comparison of criminal recidivism among schizophrenic and nonschizophrenic offenders. International Journal of Law and Psychiatry 15:397–408.
1993 Psychopathy, Schizophrenia, Alcohol Abuse and Violent Recidivism. Research Report Vol. X, No. 3. Penetanguishene, Ontario, Canada: Mental Health Centre.

Rice, Marnie E., Vernon L. Quinsey, and Grant T. Harris
1991 Sexual recidivism among child molesters released from a maximum security psychiatric institution. Journal of Consulting and Clinical Psychology 59:381–386.

Rice, Marnie E., Grant T. Harris, Carol Lang, and Valerie Bell
1990 Criminological and Psychiatric Predictors of Recidivism among Male Insanity Acquittees. Research Report Vol. VII, No. 4. Penetanguishene, Ontario, Canada: Mental Health Centre.

Robins, Lee N. and Kathryn S. Ratcliffe
1980 Childhood conduct disorders and later arrest. In Lee N. Robins, Paula J. Clayton, and John Kenneth Wing (eds.), The Social Consequences of Psychiatric Illness. New York: Brunner/Mazel.

Robinson, David and Frank J. Porporino
1989 Validation of an Adult Offender Classification System for Newfoundland and Labrador. Report No. R.04. Research Branch. Ottawa: Solicitor General of Canada.

Rogers, Sally
1981 Factors Related to Recidivism among Adult Probationers in Ontario. Toronto: Ontario Ministry of Correctional Services.

Roundtree, George A., Dan W. Edwards, and Jack B. Parker
1984 A study of the personal characteristics of probationers as related to recidivism. Journal of Offender Counselling, Services, and Rehabilitation 8:53–61.

Sampson, Allan
1974 Post-prison success prediction. Criminology 12:155–173.

Serin, Ralph C.
1990 Recidivism Prediction: A Comparison of the Psychopathy Checklist and Actuarial Risk Scales. Ottawa: Correctional Service Canada.

Serin, Ralph C. and Howard E. Barbaree
1993 Decision issues in risk assessment. Federal Probation 5:22–25.

Serin, Ralph C., Ray DeV. Peters, and Howard E. Barbaree
1990 Predictors of psychopathy and release outcome in a criminal population. Psychological Assessment: A Journal of Consulting and Clinical Psychology 2:419–422.

Shannon, Lyle W.
1985 Risk assessment vs. real prediction: The prediction problem and public trust. Journal of Quantitative Criminology 1:159–185.

Stattin, Håkan and David Magnusson
1989 The role of early aggressive behaviour in the frequency, seriousness and types of later crime. Journal of Consulting and Clinical Psychology 57:710–718.

Steadman, Henry J.
1973 Follow-up on Baxstrom patients returned to hospitals for the criminally insane. American Journal of Psychiatry 130:317–319.

Steadman, Henry J. and Joseph Cocozza
1974 Careers of the Criminally Insane: Excessive Social Control of Deviance. Lexington, Mass.: D.C. Heath.

Steadman, Henry J., Joseph J. Cocozza, and Mary Evans Melick
1978 Explaining the increased arrest rate among mental patients: The changing clientele of state hospitals. American Journal of Psychiatry 135:816–820.

Tarling, Roger and John A. Perry
1985 Statistical methods in criminological prediction. In David P. Farrington and Roger Tarling (eds.), Prediction in Criminology. Albany: State University of New York Press.

Tennent, Gavin and Cynthia Way
1984 The English special hospital - A 12-17 year follow up study: A comparison of violent and nonviolent re-offenders and non-offenders. Medicine, Science, and the Law 24:81–91.

Thornberry, Terence P. and Joseph E. Jacoby
1979 The Criminally Insane: A Community Follow-up of Mentally Ill Offenders. Chicago: University of Chicago Press.

Wallander, Jan L.
1988 The relationship between attention problems in childhood and antisocial behaviour eight years later. Journal of Child Psychology and Psychiatry 29:53–61.

Werner, Eric and Ted Palmer
1976 Psychological characteristics of successful and unsuccessful parolees: Implications of heteroscedastic and non-linear relationships. Journal of Research in Crime and Delinquency 13:165–178.

West, Donald J. and David P. Farrington
1977 The Delinquent Way of Life. London: Heinemann.

Wheeler, Gerald R. and Rodney V. Hissong
1990 Transferability of probation risk-assessment instruments: A case for caution. Evaluation and Program Planning 13:399–406.

Widom, Cathy S.
1989 The cycle of violence. Science 244:160–166.

Wilbanks, William L.
1985 Predicting failure on parole. In David P. Farrington and Roger Tarling (eds.), Prediction in Criminology. Albany: State University of New York Press.

Wormith, J. Stephen and Colin S. Goldstone
1984 The clinical and statistical prediction of recidivism. Criminal Justice and Behavior 11:3–34.

Wormith, J. Stephen and Monica Ruhl
1986 Preventive detention in Canada. Journal of Interpersonal Violence 1:399–430.

Wright, Kevin N., Todd R. Clear, and Paul Dickson
1984 Universal applicability of probation risk-assessment instruments. Criminology 22:113–134.

Zamble, Edward and Frank Porporino
1990 Coping, imprisonment, and rehabilitation: Some data and their implications. Criminal Justice and Behavior 17:53–70.