

Supplement To  
Classification for Parole Decision Policy

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Draft - March 1977

Prepared under grant number 75 NI-99-0004 to the Criminal Justice Research Center, Albany, New York from the National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration.

This supplement includes the following documents:

1. Gottfredson, D.M., Brown, W.H. and Pasela, G.E., "Working Papers on Parole Prediction for the United States Parole Commission, March, 1977.
2. Andreasen, K., Brown, W.H., Dodsley, G., Neithercutt, M.G., Pasella, G.E., Pfoutz, D., Springer, S. "Classification for Parole Decision Policy - Subcontractor's Final Report."

45632

March, 1977

Working Papers on Parole Prediction for the  
United States Parole Commission

Gottfredson, D. M., Brown, W. H., and Pasela, G. E.

Sample Preparation

The data were keypunched, edited and corrected. A total of 1,833 subjects was coded. Prior to beginning analysis, those subjects with sentences of 13 months or less were excluded; there were 106 of those. From the remaining 1,727 cases, those subjects with missing follow-up data\* were excluded: 41 cases. These were then separated into males (1,594 cases) and females (92 cases).

Some rudimentary analysis was performed on the females. The males were then separated into adults (1,223 cases) and juveniles (371 cases).\*\*

According to a random number procedure, the adults were divided into two samples: a 607-case "construction" sample to be used for the development of prediction measures and a 616-case "validation" sample to be used for validating the prediction measures.

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\* Follow-up was considered missing in those cases where the F. B. I. record was not located.

\*\* Adults and juveniles were defined according to commitment status: Adult Regular, Adult Indeterminate, and NARA cases were considered adults; YCA and FJDA cases were considered juveniles.

Total cases coded	1,833
Subjects with sentences of 13 months or less	- 106
Study Sample	1,727
Subjects without follow-up data	- 41
Subjects with follow-up data	1,686
Females	- 92
Males	1,594
Juvenile Males	- 371
Adult Males	1,223
Construction sample	- 607
Validation sample	616

## DEVELOPMENT OF BURGESS B.E.

The 607-case adult male "construction" sample was analysed. Frequency tables were prepared with all potential predictor variables versus the outcome criterion (F.B.I. Outcome). Based on these tables, all variables which appeared to have predictive power were recoded to dichotomous form (if they were not dichotomous in their original form). Forty-two such variables were found.

The next step was to compute  $\chi^2$  for each predictor variable versus outcome and to compute  $\chi^2$  sums (for each predictor variable, the sum of the  $\chi^2$ 's with each other predictor variable). At this point, these criteria were used to limit the number of predictor variables:

1. insignificant relationship with outcome (items with  $\chi^2$  not significant at .05 were eliminated)
2. low coding reliability
3. ethical considerations (race and age at first arrest were eliminated)
4. high degree of overlap with other potential predictors (as measured by  $\chi^2$  sum)



5. theoretical considerations (in the case where two or more variables seemed to indicate a single concept, one or more of them may have been eliminated due to their complex or ambiguous nature).

After elimination of variables, a total of 28 predictor variables remained.

The following set of tables is organized in this manner: they are labeled I a through g, II a through g, and III a through g, representing three different predictive devices. For each, "a" describes the items which make up the device; b, d, and f show the scoring for the 607-case adult sample, the 616-case adult sample, and the 371-case juvenile sample, respectively; c, e, and g are summaries of b, d, and f. These summaries are derived by breaking the sample into seven categories as follows:

1. more than 1.5 S.D.'s below mean
2. between 1 and 1.5 S.D.'s below mean
3. between .5 and 1 S.D.'s below mean
4. between .5 S.D.'s below mean and .5 S.D.'s above mean
5. between .5 and 1 S.D.'s above mean
6. between 1 and 1.5 S.D.'s above mean
7. more than 1.5 S.D.'s above mean

TABLE 1a  
28-ITEM BURGESS B.E.

Variable Number	Description	Score 1 IF
295	Age at First Conviction	23 or over
297	Age at First Commitment	21 or over
302	Military Discharge	honorable
289	Grade Claimed	12 or more
203	Longest Job in Free Community	more than 1 year
290	Marital Status	single, married, or common law
201	Drugs	no known use
64	Drugs	no use of sedatives (including barbiturates)
299	Longest Time Served on Any Commitment	none, 6 months or less, or more than 60 months
147	Longest Time Free/Prior Incarcerations	more than 60 months or no prior incarcerations
220	Escape History	none
152	Other Prior Sentences (non-prison)	none
186	Property Offense Convictions	none
162	Burglary Convictions	none
188	Burglary Convictions	fewer than 2
164	Auto Theft Convictions	none
165	Forgery Convictions	none
179	Juvenile Delinquency Commitments	none
193	Theft Convictions	none
303	Total Convictions	One (i.e., no prior convictions)
309	Age per Conviction (Age at Admission in years divided by Total Convictions)	more than 6.0
291	Current Offense: Property	no
127	Current Offense: Vehicle Theft	no
292	Dollar Value	\$1,000 or over
195	Living Arrangement Before Commitment	Wife and/or children
196	Living Arrangement Before Commitment	<u>not</u> Parents or Guardian
300	Probation or Parole Revocations	<u>no</u> parole revocations
288	How Committed	<u>not</u> Mandatory Release Violator

TABLE 1b  
28-ITEM BURGESS B.E.  
607-CASE CONSTRUCTION SAMPLE

Score	N	N Success	N Failure	Percent Success
0	0	0	0	-
1	0	0	0	-
2	0	0	0	-
3	0	0	0	-
4	1	0	1	0
5	2	1	1	50
6	3	1	2	33
7	10	6	4	60
8	22	15	7	68
9	35	19	16	54
10	34	18	16	53
11	42	27	15	64
12	49	36	13	73
13	41	25	16	61
14	56	45	11	80
15	45	35	10	78
16	43	35	8	81
17	31	27	4	87
18	28	28	0	100
19	30	26	4	87
20	21	19	2	90
21	34	31	3	91
22	23	20	3	87
23	24	23	1	96
24	11	10	1	91
25	13	13	0	100
26	7	7	0	100
27	2	2	0	100
28	0	0	0	-
Total	607	469	138	77
Score Mean	15.30	16.10	12.54	
Score S.D.	4.86			
$r_{pb} = .308$				

TABLE 1c  
28-ITEM BURGESS B.E.  
607-CASE CONSTRUCTION SAMPLE  
(SUMMARIZED)

Score	N	N Success	N Failure	Percent Success
0- 8	38	23	15	61
9-10	69	37	32	54
11-12	91	63	28	69
13-17	216	167	49	77
18-20	79	73	6	92
21-22	57	51	6	89
23-28	57	55	2	96
Total	607	469	138	77

TABLE 1d  
28-ITEM BURGESS B.E.  
616-CASE VALIDATION SAMPLE

Score	N	N Success	N Failure	Percent Success
0	0	0	0	-
1	0	0	0	-
2	0	0	0	-
3	0	0	0	-
4	1	1	0	100
5	1	1	0	100
6	3	2	1	67
7	6	1	5	17
8	17	9	8	53
9	31	21	10	68
10	42	29	13	69
11	44	30	14	68
12	57	42	15	74
13	43	30	13	70
14	50	30	20	60
15	50	42	8	84
16	42	32	10	76
17	29	23	6	79
18	31	27	4	87
19	27	27	0	100
20	23	21	2	91
21	32	32	0	100
22	30	26	4	87
23	17	17	0	100
24	15	15	0	100
25	14	14	0	100
26	5	5	0	100
27	6	6	0	100
28	0	0	0	100
Total	616	483	133	78
Score Mean	15.43	16.17	12.71	
Score S.D.	4.84			
$r_{pb} = .295$				

TABLE 1e  
 28-ITEM BURGESS B.E.  
 616-CASE VALIDATION SAMPLE  
 (SUMMARIZED)

Score	N	N Success	N Failure	Percent Success
0- 8	28	14	14	50
9-10	73	50	23	68
11-12	101	72	29	71
13-17	214	157	57	73
18-20	81	75	6	93
21-22	62	58	4	94
23-28	57	57	0	100
Total	616	483	133	78

TABLE 1f  
28-ITEM BURGESS B.E.  
371-CASE JUVENILE VALIDATION SAMPLE

Score	N	N Success	N Failure	Percent Success
0	0	0	0	-
1	0	0	0	-
2	0	0	0	-
3	0	0	0	-
4	0	0	0	-
5	0	0	0	-
6	2	1	1	50
7	8	3	5	38
8	23	16	7	70
9	28	16	12	57
10	38	28	10	74
11	29	20	9	69
12	36	23	13	64
13	30	19	11	63
14	38	32	6	84
15	30	24	6	80
16	25	20	5	80
17	17	12	5	71
18	12	10	2	83
19	14	13	1	93
20	13	13	0	100
21	11	8	3	73
22	11	10	1	91
23	4	4	0	100
24	1	0	1	0
25	1	1	0	100
26	0	0	0	-
27	0	0	0	-
28	0	0	0	-
Total	371	273	98	74
Score Mean	13.62	14.09	12.31	
Score S.D.	4.06			
$r_{pb} = .193$				

TABLE 1g  
28-ITEM BURGESS B.E.  
371-CASE JUVENILE VALIDATION SAMPLE  
(SUMMARIZED)

Score	N	N Success	N Failure	Percent Success
0- 8	33	20	13	61
9-10	66	44	22	67
11-12	65	43	22	66
13-17	140	107	33	76
18-20	39	36	3	92
21-22	22	18	4	82
23-28	6	5	1	83
Total	371	273	98	74



TABLE 2a  
11-ITEM BURGESS B.E. (SALIENT FACTORS)

Variable Number	Description	Score 1 IF
127	Offense	not auto theft
15	Codefendants	yes
155	Prior Incarcerations	none
152	Other Prior Sentences	none
26	Longest Time Free Since First Commitment	none or less than or equal to 18 months.
289	Grade Claimed	12 or greater
156	Probation or Parole Revocations	none
24	Age at First Conviction	18 or over
25	Age at First Commitment	18 or over
70	Employment in Last Two Years of Civilian Life	more than 25% of time, or student or unemployable 75% of time or more or unknown
213	Planned Living Arrangement	wife and/or children

TABLE 2b  
 11-ITEM BURGESS B.E.  
 (SALIENT FACTORS)  
 607-CASE ADULT ~~VALIDATION~~ <sup>CONSTRUCTION</sup> SAMPLE

Score	N	N Success	N Failure	Percent Success
0	0	0	0	-
1	8	4	4	50
2	55	29	26	53
3	70	46	24	66
4	107	81	26	76
5	108	85	23	79
6	84	65	19	77
7	46	41	5	89
8	53	45	8	85
9	45	43	2	96
10	30	29	1	97
11	1	1	0	100
Total	607	469	138	77
Score Mean	5.37	5.70	4.26	
Score S.D.	2.29			
$r_{pb} = .264$				

TABLE 2c  
11-ITEM BURGESS B.E. (SALIENT FACTORS)  
607-CASE ADULT VALIDATION SAMPLE  
(SUMMARIZED)

Score	N	N Success	N Failure	Percent Success
0, 1	8	4	4	50
2, 3	125	75	50	60
4	107	81	26	76
5, 6	192	150	42	78
7	46	41	5	89
8	53	45	8	85
9 -11	76	73	3	96
Total	607	469	138	77

TABLE 2d  
11-ITEM BURGESS B.E. (SALIENT FACTORS)  
616-CASE ADULT VALIDATION SAMPLE

Score	N	N Success	N Failure	Percent Success
0	1	1	0	100
1	17	13	4	76
2	48	31	17	65
3	68	42	26	62
4	82	62	20	76
5	125	91	34	73
6	77	56	21	73
7	56	52	4	93
8	48	43	5	90
9	60	58	2	97
10	29	29	0	100
11	5	5	0	100
Total	616	483	133	78
Score Mean	5.51	5.83	4.35	
Score S.D.	2.39			
$r_{pb} = .255$				

Table 2e  
 11-ITEM BURGESS B.E. (SALIENT FACTORS)  
 616-CASE ADULT VALIDATION SAMPLE  
 (SUMMARIZED)

Score	N	N Success	N Failure	Percent Success
0, 1	18	14	4	78
2, 3	116	73	43	63
4	82	62	20	76
5, 6	202	147	55	73
7	56	52	4	93
8	48	43	5	90
9 -11	94	92	2	98
Total	616	483	133	78

TABLE 2f  
11-ITEM BURGESS B.E. (SALIENT FACTORS)  
371-CASE JUVENILE VALIDATION SAMPLE

Score	N	N Success	N Failure	Percent Success
0	2	1	1	50
1	9	7	2	78
2	47	28	19	60
3	61	45	16	74
4	67	39	28	58
5	49	38	11	78
6	38	32	6	84
7	36	28	8	78
8	30	27	3	90
9	22	19	3	86
10	10	9	1	90
11	0	0	0	-
Total	371	273	98	74
Score Mean	4.90	5.16	4.16	
Score S.D.	2.31			
$r_{pb} = .191$				

TABLE 2g  
11-ITEM BURGESS B.E. (SALIENT FACTORS)  
371-CASE JUVENILE VALIDATION SAMPLE  
(SUMMARIZED)

Score	N	N Success	N Failure	Percent Success
0, 1	11	8	3	73
2, 3	108	73	35	68
4	67	39	28	58
5, 6	87	70	17	80
7	36	28	8	78
8	30	27	3	90
9 - 11	32	28	4	88
Total	371	273	98	74

TABLE 3a  
9-ITEM BURGESS B.E.

Variable Number	Description	IF	Score
073	Total Convictions	1 2 or 3 more than 3	2 1 0
031	Prior Incarcerations	0 1 or 2 more than 2	2 1 0
025	Age at First Commitment	18 or older under 18	1 0
127	Commitment Offense	not Auto Theft Auto Theft	1 0
032	Probation or Parole Revocations	None or Probation Revoked Parole Revoked or both Probation and Parole Revoked	1  0
064, 065	Drug Use	No use of Opiates and No use of Sedatives Use of Opiates or Sedatives	1  0
289	Grade Claimed	12 or higher less than 12	1 0
204	Employment in Last Two Years of Civilian Life	more than 6 months 6 months or less	1 0
082	Planned Living Arrangement	Wife and/or Children Other	1 0



TABLE 3b  
9-ITEM BURGESS B.E.  
607-CASE ADULT CONSTRUCTION SAMPLE

Score	N	N Success	N Failure	Percent Success
0	0	0	0	-
1	10	3	7	30
2	53	30	23	57
3	76	48	28	63
4	122	91	31	75
5	97	74	23	76
6	56	46	10	82
7	61	59	2	97
8	55	46	9	84
9	34	31	3	91
10	30	29	1	97
11	13	12	1	92
Total	607	469	138	77
Score Mean	5.38	5.75	4.13	
Score S.D.	2.41			
$r_{pb} = .282$				

TABLE 3c  
9-ITEM BURGESS B.E. (HOFFMAN)  
607-CASE ADULT CONSTRUCTION SAMPLE  
(SUMMARIZED)

Score	N	N Success	N Failure	Percent Success
0, 1	10	3	7	30
2	53	30	23	57
3, 4	198	139	59	70
5, 6	153	120	33	78
7	61	59	2	97
8, 9	89	77	12	87
10,11	43	41	2	95
Total	607	469	138	77

TABLE 3d

9-ITEM BURGESS B.E.  
616-CASE ADULT VALIDATION SAMPLE

Score	N	N Success	N Failure	Percent Success
0	0	0	0	-
1	8	5	3	63
2	48	35	13	73
3	99	68	31	69
4	101	68	33	67
5	85	64	21	75
6	68	52	16	76
7	69	57	12	83
8	49	46	3	94
9	32	31	1	97
10	44	44	0	100
11	13	13	0	100
Total	616	483	133	78
Score Mean	5.494	5.821	4.301	
Score S.D.	2.47			
$r_{pb} = .253$				

TABLE 3e  
 9-ITEM BURGESS B.E. (HOFFMAN)  
 616-CASE VALIDATION SAMPLE  
 (SUMMARIZED)

Score	N	N Success	N Failure	Percent Success
0, 1	8	5	3	63
2	48	35	13	73
3, 4	200	136	64	68
5, 6	153	116	37	76
7	69	57	12	83
8, 9	81	77	4	95
10, 11	57	57	0	100
Total	616	483	133	78

TABLE 3f  
9-ITEM BURGESS B.E.  
371-CASE JUVENILE VALIDATION SAMPLE

Score	N	N Success	N Failure	Percent Success
0	0	0	0	-
1	1	0	1	0
2	24	13	11	54
3	49	31	18	63
4	47	26	21	55
5	60	48	12	80
6	63	49	14	78
7	43	34	9	79
8	38	29	9	76
9	31	31	0	100
10	14	11	3	79
11	1	1	0	100
Total	371	273	98	74
Score Mean	5.652	5.960	4.796	
Score S.D.	2.191	2.160	2.056	
$r_{pb} = .235$				

TABLE 3g  
9-ITEM BURGESS B.E. (HOFFMAN)  
371-CASE JUVENILE VALIDATION SAMPLE  
(SUMMARIZED)

Score	N	N Success	N Failure	Percent Success
0, 1	1	0	1	0
2	24	13	11	54
3, 4	96	57	39	59
5, 6	123	97	26	79
7	43	34	9	79
8, 9	69	60	9	87
10, 11	15	12	3	80
Total	371	273	98	74

### Multiple Regression - B.E. Generation

Sixty-seven potential predictors were selected by inspection of the cross-tabulation of all items (original and recoded) with the dichotomous parole performance criterion (in the 607-case construction sample). In Appendix A is shown a summary of these items, the relationship to parole performance and their reliability. (In Appendix B is shown the matrix of inter-correlations). These 67 items were entered into a stepwise multiple regression (Sub-Program Regression of the Statistical Package for the Social Sciences). From the output of this run 16 of the "best" items were selected. These 16 items were entered into a regression with Parole Performance (Program BMD03R of Biomedical Computer Programs). A summary of the regression is shown in Table 4.

Based on the individual proportion of variance accounted for by the variables in this regression, 9 variables were selected and a regression performed on these variables. A summary of this regression is shown in Table 5. The multiple R for this regression was .3539.

The validation  $r$  of this regression expression in the 616-case validation sample was .2203. This represents a large amount of shrinkage. In an attempt to discover which variables were primarily responsible for this shrinkage, the same nine variables were run on the regression program (BMD03R) in the validation sample. A summary of the regression is included as Table 6.

SELECTION NO. 1- 1

TABLE

SAMPLE SIZE 607

NO. OF VARIABLES 17 NO. OF VARIABLES DELETED 0 (FOR VARIABLES DELETED, SEE BELOW)

DEPENDENT VARIABLE IS NOW NO. 251

COEFFICIENT OF DETERMINATION 0.1657

MULTIPLE CORR. COEFFICIENT 0.4071

SUM OF SQUARES ATTRIBUTABLE TO REGRESSION 17.66734

SUM OF SQUARES OF DEVIATION FROM REGRESSION 88.95869

VARIANCE OF ESTIMATE 0.15078

STD. ERROR OF ESTIMATE 0.38830

INTERCEPT (A VALUE) 0.39480

ANALYSIS OF VARIANCE FOR THE MULTIPLE  
LINEAR REGRESSION

SOURCE OF VARIATION	D.F.	SUM OF SQUARES	MEAN SQUARES	F VALUE
DUE TO REGRESSION.....	16	17.66734	1.10421	7.3234
DEVIATION ABOUT REGRESSION...	590	88.95869	0.15078	
TOTAL...	606	106.62603		

VARIABLE NO.	MEAN	STD. DEVIATION	REG. COEFF.	STD. ERROR OF REG. COE.	COMPUTED T VALUE	PARTIAL CORR. COE.	SUM OF SQ. ADDED	PROP. VAR CUM.
85 ESCAPE HIST.	0.24217	0.53183	-0.19555	0.07737	-2.52739	-0.10349	1.24022	0.01163
19 TYPE SENT.	0.74465	0.43642	-0.10562	0.08821	-2.76448	-0.11808	0.89855	0.00843
47 LGST TM FREE	0.46623	0.49927	0.08828	0.03592	2.45748	0.10066	3.42174	0.03209
85 PRO PROP. CONV	2.77430	2.48895	-0.01563	0.00892	-1.75192	-0.07194	2.27112	0.02130
91 AUTO THFT SPEC	0.20264	0.40229	0.08695	0.04723	1.84098	0.07558	0.45367	0.00425
96 LIVING ARRAG	0.15321	0.36049	-0.12671	0.04450	-2.84747	-0.11643	1.43274	0.01344
20 ESCAPE HIST	0.80231	0.39859	-0.23083	0.10405	-2.21842	-0.09095	0.28886	0.00271
76 SEN. LENGTH	60.00659	60.11123	0.00077	0.00028	2.77583	0.11354	0.28928	0.00271
82 TM FREE P/CONV	89.30478	88.26534	0.00023	0.00023	1.00387	0.04129	0.45709	0.00429
88 HOW COM.	0.91433	0.28010	0.21623	0.06475	3.33956	0.13621	2.72501	0.02556
89 GRADE CLM.	0.29160	0.45487	0.08741	0.03676	2.37792	0.09743	1.13128	0.01061
90 MAR. STA.	0.66557	0.47218	0.06951	0.03483	1.99558	0.08188	0.45862	0.00430
95 AGE AT	0.29654	0.45711	-0.18426	0.05924	-2.66103	-0.10890	0.01984	0.00018
96 1ST COM.	2.15651	0.64246	0.15937	0.04892	3.25794	0.13294	1.70459	0.01599
00 PROB OR PAR. RV	0.73641	0.44094	0.07425	0.04224	1.75782	0.07218	0.51769	0.00486
02 MIL DISCHARGE	0.19110	0.39349	0.06659	0.04324	1.53993	0.06327	0.35755	0.00335
51 OUTCOME	0.77265	0.41946						



SELECTION NO. 1- 2

TABLE

SAMPLE SIZE 607

NO. OF VARIABLES 10

NO. OF VARIABLES DELETED 7 (FOR VARIABLES DELETED, SEE BELOW)

DEPENDENT VARIABLE IS NOW NO. 251

COEFFICIENT OF DETERMINATION 0.1252

MULTIPLE CORR. COEFFICIENT 0.3539

SUM OF SQUARES ATTRIBUTABLE TO REGRESSION

13.35247

SUM OF SQUARES OF DEVIATION FROM REGRESSION

93.27356

VARIANCE OF ESTIMATE 0.15624

STD. ERROR OF ESTIMATE 0.39527

INTERCEPT (A VALUE) 0.54083

ANALYSIS OF VARIANCE FOR THE MULTIPLE  
LINEAR REGRESSION

SOURCE OF VARIATION	D.P.	SUM OF SQUARES	MEAN SQUARES	F VALUE
DUE TO REGRESSION.....	9	13.35247	1.48361	9.4959
DEVIATION ABOUT REGRESSION...	597	93.27356	0.15624	
TOTAL...	606	106.62603		

VARIABLE NO.	MEAN	STD. DEVIATION	REG. COEFF.	STD. ERROR OF REG. COE.	COMPUTED T VALUE	PARTIAL CORR. COE.	SUM OF SQ. ADDED	PROP. VAL. CUM.
85 ESCAPE HIST	0.24217	0.53183	-0.03165	0.03234	-0.97857	-0.04002	1.24022	0.01165
19 TYPE SENT	0.74465	0.43642	-0.10362	0.03772	-2.74724	-0.11173	0.89855	0.00843
47 LGST TM FREE	0.46623	0.49927	0.08995	0.03550	2.53412	0.10316	3.42174	0.03202
85 PRI PROP CONV	2.77430	2.48895	-0.01583	0.00767	-2.06516	-0.08422	2.27112	0.02136
96 LIVING ARRAG	0.15321	0.36049	-0.12987	0.04506	-2.88200	-0.11714	1.41944	0.01335
88 HOW COMM	0.91433	0.28010	0.17377	0.06467	2.68699	0.10931	1.92536	0.01801
89 GRADE CLAIMED	0.29160	0.45487	0.09278	0.03656	2.53752	0.10330	1.23833	0.01165
96 AGE AT 1ST COM	2.15651	0.64246	0.04884	0.02687	1.81756	0.07418	0.57555	0.00546
00 PROB OR PAR RV	0.73641	0.44094	0.06420	0.04217	1.52250	0.06219	0.36216	0.00340
51 OUTCOME	0.77265	0.41946						

TABLE 6

SAMPLE SIZE 616  
 NO. OF VARIABLES 10 NO. OF VARIABLES DELETED 0 (FOR VARIABLES DELETED, SEE BELOW)  
 DEPENDENT VARIABLE IS NOW NO. 251

COEFFICIENT OF DETERMINATION 0.0811  
 MULTIPLE CORR. COEFFICIENT 0.2848

SUM OF SQUARES ATTRIBUTABLE TO REGRESSION 8.45624  
 SUM OF SQUARES OF DEVIATION FROM REGRESSION 95.82785

VARIANCE OF ESTIMATE 0.15813  
 STD. ERR R OF ESTIMATE 0.39766

INTERCEPT (A VALUE) 0.79182

ANALYSIS OF VARIANCE FOR THE MULTIPLE  
 LINEAR REGRESSION

SOURCE OF VARIATION	D.F.	SUM OF SQUARES	MEAN SQUARES	F VALUE
DUE TO REGRESSION.....	9	8.45624	0.93958	5.9418
DEVIATION ABOUT REGRESSION...	606	95.82785	0.15813	
TOTAL...	615	104.28409		

VARIABLE NO.	MEAN	STD. DEVIATION	REG. COEFF.	STD. ERROR OF REG. COE.	COMPUTED T VALUE	PARTIAL CORR. COE.	SUM OF SQ. ADDED	PROP. VAR. CUM.	PROP. VAR. CUM. IN CNSTR. SAMPLE
85 ESCAPE HIST	0.28409	0.61853	-0.02919	0.02788	-1.04717	-0.04250	1.56938	0.01505	0.01163
119 TYPE SENT	0.79870	0.40130	0.00172	0.04125	0.04160	0.00169	0.00214	0.00002	0.00843
147 LGST TM FREE	0.47890	0.49996	0.10448	0.03523	2.96535	0.11959	3.70505	0.03553	0.03209
185 PRI PROP CONV	2.65909	2.50216	-0.02866	0.00746	-3.84072	-0.15415	2.86391	0.02746	0.02130
196 LIVING ARRAG	0.19643	0.39762	-0.03554	0.04079	-0.87109	-0.03536	0.13141	0.00126	0.01331
288 HOW COMM	0.94318	0.23168	-0.03200	0.07519	-0.42565	-0.01729	0.01880	0.00018	0.01806
289 GRADE CLAIMED	0.31656	0.46551	0.01383	0.03508	0.39412	0.01601	0.04102	0.00039	0.01161
296 AGE AT 1ST COM	2.19318	0.64267	0.02263	0.02727	0.82976	0.03369	0.11265	0.00108	0.00540
300 PROB OR PAR RV	0.74675	0.43522	0.01143	0.04171	0.27412	0.01113	0.01188	0.00011	0.00340
251 OUTCOME	0.78409	0.41179							

TABLE 7  
MULTIPLE REGRESSION B.E.

<u>VARIABLE NO.</u>	<u>DESCRIPTION</u>	<u>SCORE</u>
--	All Subjects	54
85	Escape History	-3X (VAR 85)
119	Type of Sentence	-10X (VAR 113)
147	Longest Time Free	+9X (VAR 147)
185	Prior Property Convictions	-2X (VAR 185)
196	Living Arrangement	-13X (VAR 196)
288	How Committed	+17X (VAR 288)
289	Highest Grade Claimed	+9X (VAR 289)
296	Age at 1st Committment	+5X (VAR 296)
300	Probation or Parole Revocations	6X (VAR 300)

Predicted Parole Perf. X 100 = TOTAL

TABLE 8  
MULTIPLE REGRESSION B.E.  
607-CASE ADULT CONSTRUCTION SAMPLE  
(SUMMARIZED)

Score	N	N Success	N Failure	Percent Success
0-55	54	23	31	43
56-62	44	28	16	64
63-70	83	57	26	69
71-85	231	182	49	79
86-92	96	86	10	90
93-100	68	62	6	91
100+	31	31	0	100
Total	607	469	138	77
Score Mean	77.76	80.61	68.07	
Score S.D.	14.9			
$r_{pb} = .354$				

TABLE 9  
 MULTIPLE REGRESSION B.E.  
 616-CASE ADULT ~~CONSTRUCTION~~ SAMPLE  
 (SUMMARIZED) *validation*

Score	N	N Success	N Failure	Percent Success
0-55	47	31	16	66
56-62	48	30	18	63
63-70	81	56	25	69
71-85	255	196	59	77
86-92	92	84	8	91
93-100	61	55	6	90
100+	32	31	1	97
Total	616	483	133	78
Score Mean	77.79	79.45	71.77	
Score S.D.	14.22			
$r_{pb} = .220$				

### Comparison of Types of Release

Analysis of Covariance was run (on the total adult sample N=1223) using two of the B.E.'s developed; the 28 Item Burgess B.E. and the Multiple Regression B.E. The dependent variable was parole performance (0, 1) defined in the same way as for the B.E. Generation. The three experimental Groups were defined by type of Release: Parole, Manditory Release, and Expiration.

In Tables 10-A and 10-B is shown the data summary and ANOCV Table for the analysis using the Burgess B.E. as the covariable. (X is the dependent variable, parole performance; Y is the Covariate, the Burgess B.E.). The F-ratio in the Summary Table under the column labeled "F" is the relevant statistic for the test among adjusted means. The F-ratio labeled "Test Significance of Covariance" relates to a significance test of the covariance adjustment itself.

In Tables 11-A and 11-B is shown the data summary and ANOCV Table for the same analysis with the regression derived B.E. being used in place of the Burgess (again, parole performance is labeled X and the Covariate Y).

TABLE 10-A

GROUP	N	X-SUM	X**2-SUM	Y-SUM	Y**2-SUM	X*Y-SUM	X-MEAN	X-SD	Y-MEAN	Y-SD	XY-CORR
PAROLE	450.	400.	400.	8046.	154048.	7327.	0.89	0.3146	17.88	4.7629	0.2601
MAN. REL.	473.	349.	349.	6587.	100665.	5062.	0.74	0.4403	13.93	4.3507	0.2232
EXPIR- ATION	300.	203.	203.	4150.	62488.	2974.	0.68	0.4685	13.83	4.1218	0.2872
TOTAL	1223.	952.	952.	18783.	317201.	15363.	0.778	0.4155	15.358	4.8487	0.3014

TABLE 10-B

SOURCE	SSX	SSY	SP	SSX-DUE	SSX-ABOUT	CORR-MSX	DF	F
TREATMNT	9.38	4.53E 03	199.40	6.9981	2.38	1.189159	2	7.653362
ERROR	201.57	2.42E 04	542.66	12.1687	189.41	0.155377	1219	
TOTAL	210.95	2.87E 04	742.05	19.1668	191.78			

TEST SIGNIFICANCE OF COVARIANCE

F = 78.31705 WITH 1 AND 1219 DF

CORRECTION TABLE OF ADJUSTED MEANS

GROUP	N	UNADJUSTED MEAN	ADJUSTED MEAN	ADJUSTED S.E.
PAROLE	450.	0.888889	0.832338	0.019650
MAN. REL.	473.	0.737844	0.769958	0.018484
EXPIR- ATION	300.	0.676667	0.710659	0.023084

12 23

TABLE 11-A

GROUP	N	X-SUM	X**2-SUM	Y-SUM	Y**2-SUM	X*Y-SUM	X-MEAN	X-SD	Y-MEAN	Y-SD	XY-CORR
PAROLE	450.	400.	400.	376.	322.	339.	0.89	0.3146	0.84	0.1299	0.2302
MAN. REL.	473.	349.	349.	350.	267.	264.	0.74	0.4403	0.74	0.1380	0.2227
EXPIR- ATION	300.	203.	203.	219.	167.	154.	0.68	0.4685	0.73	0.1492	0.2737
TOTAL	1223.	952.	952.	945.	756.	757.	0.778	0.4155	0.773	0.1461	0.2882

TABLE 11-B

SOURCE	SSX	SSY	SP	SSX-DUE	SSX-ABOUT	CORR-MSX	DF	F
TREATMNT	9.38	2.84E 00	5.04	6.0424	3.33	1.667020	2	10.690156
ERROR	201.57	2.32E 01	16.33	11.4832	190.09	0.155940	1219	
TOTAL	210.95	2.61E 01	21.37	17.5256	193.42			

TEST SIGNIFICANCE OF COVARIANCE

F = 73.63891 WITH 1 AND , 1219 DF

CORRECTION TABLE OF ADJUSTED MEANS

GROUP	N	UNADJUSTED MEAN	ADJUSTED MEAN	ADJUSTED S.E.
PAROLE	450.	0.888889	0.844567	0.019319
MAN. REL.	473.	0.737844	0.761607	0.018367
EXPIR- ATION	300.	0.676667	0.705683	0.023048



APPENDIX A  
POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

In the following table are data from the 607-case "construction" sample for all of those variables which were considered to be potential predictors of parole outcome.<sup>1</sup> Included are essentially all variables which were coded prior to a subject's release. Also included are transformed versions of many of these variables. These transformations were performed for several reasons: to group like categories together; to dichotomize variables for the construction of Burgess prediction devices; and to reduce ambiguity and, therefore, increase expected item reliability. Transformations of each variable are described in the columns headed "New Description," "Old Values," and "New Values."

Variable numbers were assigned sequentially and are, therefore, arbitrary. In the column headed "N" is shown the number of cases which were coded with each particular value of a variable. "Success Percentage" refers to the percentage of those subjects who were found to be "successes."

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<sup>1</sup>Parole outcome is a two-category (success and failure) classification. A subject was considered a success if, according to FBI records, he was convicted of no new offense during the two-year, follow-up period.

The total "N" for each variable is 607 except where information was unavailable the variable was not applicable for a subject.

Phi,<sup>2</sup> a measure of association for contingency tables, was computed for each variable. Higher values of phi indicate a greater degree of association with the success criterion mentioned above. Cases where the value of a variable is unknown or not applicable are shown with an appropriate description after the totals for the variable and are not included in the computation of phi.

For some of those variables which were regarded as ordinal (as opposed to nominal), point biserial  $r^3$  with the success criterion was also computed and is shown in italics.

In a separate study (see Report Number ), coding reliability was also assessed for each of the original variables. A 10% sample of the originally coded cases was recoded and percentage agreement between the two samples was computed for each variable. A reliability coefficient (Pearson  $r$ ) was computed for the ordinal variables (it is shown in italics), and a "coefficient of agreement"<sup>4</sup> was computed for the nominal variables.

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<sup>2</sup>Hays, William L., Statistics for Psychologists, San Francisco: Holt, Rinehart, and Winston, pp. 604-606.

<sup>3</sup>McNemar, Quinn, Psychological Statistics (Fourth Edition), New York: John Wiley and Sons, Inc., 1969, pp. 218-221.

<sup>4</sup>Cohen, Jacob, "A Coefficient of Agreement for Nominal Scales," in Educational and Psychological Measurement, Vol. XX, No. 1, 1960.

## APPENDIX A

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
5	HOW COMMITTED								
	Federal Court		01		458	79.5			
	Return of Study/								
	Observation Case		02		10	80.0			
	Probation Viola-								
	tion		03		30	76.7			
	State Prisoner		04		1	100			
	District of Colum-								
	bia General Ses-								
	sions Court		05		0				
	Army		07		1	100			
	Navy		08		2	100			
	Air Force		09		1	100			
	Coast Guard		10		0				
	Parole Violator		41		46	76.1			
	Parole Violator,								
	Returned on Se-								
	cond Violation		42		6	100			
	Mandatory Release								
	Violator		51		47	51.1			
	Mandatory Release								
	Violator, Re-								
	turned on Second								
	Violation		52		5	80.0			
	Mandatory Release								
	Violator, Re-								
	turned on Third								
	Violation		53		0				
	TOTAL				607	77.3	.19	99.4	.988

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
108		HOW COMMITTED							
		Federal Court	01	1	458	79.5			
		Probation Violator	03	2	30	76.7			
		Parole Violator	41-49	3	52	78.8			
		Mandatory Release Violator	51-59	4	52	53.8			
		Others	all others	5	15	86.7			
		TOTAL			607	77.3	.17		
288		HOW COMMITTED							
		Mandatory Release	51-59	0	52	53.8			
		Others	all others	1	555	79.5			
		TOTAL			607	77.3	.17		
6	TYPE OF ADMISSION								
	New Court Commitment								
	Not Probation Revoked		0		473	79.7			
	Probation Revoked		1		30	76.7			
	Parole Violator Without New Commitment		2		48	79.2			
	With New Commitment		3		4	75.0			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
6	(Cont.) Mandatory Release Violator Without New Commitment With New Commitment  TOTAL		4 5		43 9 607	53.5 55.6 77.3	.17	100	1.00
109		TYPE OF ADMISSION New Commitment Parole or Mandatory Release Violator  TOTAL	0,1  all others	1  0	503 104 607	79.5 66.3 77.3	.12		
7	SENTENCE PROCEDURE Regular Adult 4208-B (Study Case --Adult) 4208-A(1) (Court Established Parole Eligibility Date) 4208-A(2) (After Initial Hearing, Parole Date Can Be At Any Time) 5010-E (YCA Study and Observation)		10 11 12 13 14		405 1 3 178 0	77.5 100 100 75.8			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
7	(Cont.)								
	5010-B (YCA Indeterminate)		15		1	100			
	5010-C (YCA Indeterminate)		16		0				
	JO (FJDA Study and Observation)		17		0				
	FJDA, Minority		18		1	0.0			
	FJDA, Other Than Minority		19		1	100			
	DC, Juvenile		20		0				
	741 (Split Sentence)		21		0				
	4244 (Mental Competency Determination/Under Sentence)		22		0				
	4244 (Mental Competency Determination/Not Under Sentence)		23		0				
	4244 (Mental Incompetency)		24		0				
	NARA (Case Under Study)		25		1	100			
	NARA (Sentence Prisoner)		26		15	80.0			
	Sentence to Be Served on Week-ends		27		0				
	Sentence to Be Served Overnight		28		0				
	State Case		29		0				

APPENDIX A (Cont.)  
POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
7	(Cont.) Other		30		1	100			
	TOTAL				607	77.3	.10	98.7	.981
110		<u>SENTENCE PROCEDURE</u>							
		Regular Adult	10	1	405	77.5			
		YCA, Indeterminate	15	2	1	100			
		YCA, Specific	16	3	0				
		FJDA	18-19	4	2	50.0			
		Split Sentence	21	5	0				
		Others	all others	6	199	76.9			
	TOTAL				607	77.3	.04		
10	<u>ALIASES</u>								
	None		0		419	78.5			
			1		118	78.8			
			2		41	73.2			
			3		9	77.8			
			4		9	55.6			
			5		5	40.0			
			6		1	100			
			7		1	0.0			
			8		1	100			
	Nine or More		9		3	33.3			
	TOTAL				607	77.3	.15	84.5	.904
111		<u>ALIASES</u>							
			0	0	419	78.5			
			1	1	118	78.8			
			2	2	41	73.2			
			3	3	9	77.8			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
111		(Cont.)	4 or more	4	20	50.0			
		TOTAL			607	77.3	.12		
112		<u>ALIASES</u>	0	1	419	78.5			
			1 or more	0	188	74.5			
		TOTAL			607	77.3	.04		
11	<u>SEX AND ETHNIC GROUP</u>								
	White (Male)		1		435	80.5			
	White (Female)		2		0				
	Black (Male)		3		160	70.0			
	Black (Female)		4		0				
	Indian (Male)		5		9	44.4			
	Indian (Female)		6		0				
	Other (Male)		7		3	100			
	Other (Female)		8		0				
	TOTAL				607	77.3	.15	100	1.00
113		<u>SEX</u>							
		Male	1,3,5,7	1	607	77.3			
		Female	2,4,6,8	2	0				
		TOTAL			607	77.3			



APPENDIX A (Cont.)

POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
114		ETHNIC GROUP							
		White	1,2	1	435	80.5			
		Black	3,4	2	160	70.0			
		Indian	5,6	3	9	44.4			
		Other	7,8	4	3	100			
		TOTAL			607	77.3	.15		
115		ETHNIC GROUP							
		White	1,2	1	435	80.5			
		Non-White	all others	0	172	69.2			
		TOTAL			607	77.3	.12		
12	CITIZENSHIP	U.S.A.	1		603	77.1			
		Canada	2		1	100			
		Mexico	3		0				
		Other	4		2	100			
		TOTAL			606	77.2	.04	100	1.00
		Unknown	9		1				
116		CITIZENSHIP							
		U.S.A.	1	1	603	77.1			
		Other or Unknown	all others	0	4	100			
		TOTAL			607	77.3	.04		

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
13	<u>GRADE CLAIMED</u>		0		4	75.0			
			1		0				
			2		4	50.0			
			3		14	50.0			
			4		13	69.2			
			5		17	82.4			
			6		32	75.0			
			7		58	84.5			
			8		113	77.0			
			9		64	62.5			
			10		63	76.2			
			11		48	66.7			
			12		140	86.4			
			13		15	80.0			
			14		14	92.9			
			15		1	100			
			16		5	100			
			17		1	100			
			18		1	100			
	TOTAL				607	77.3	.23	87.7	.972
117	<u>GRADE CLAIMED</u>		00	0	4	75.0			
			01-08	1	251	76.5			
			09-12	2	315	76.5			
			all others	3	37	89.2			
	TOTAL				607	77.3	.07		

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
289		<u>GRADE CLAIMED</u>	0-11 12 & over	0 1	430 177	73.3 87.0			
		TOTAL			607	77.3	.15		
14	<u>MARITAL STATUS</u>		1		199	77.9			
	Single		2		183	83.6			
	Married		3		8	75.0			
	Widower		4		109	72.5			
	Divorced		5		80	67.5			
	Separated		6		22	81.8			
	Common Law								
	TOTAL				601	77.4	.13	96.1	.946
	Unknown		9		6				
118		<u>MARITAL STATUS</u>							
	Married		2	1	183	83.6			
	Unmarried		all others	0	424	74.5			
	TOTAL				607	77.3	.10		
290		<u>MARITAL STATUS</u>							
	Single, Married, Common Law		1,2 or 6	1	404	80.7			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
290		(Cont.) Others	all others	0	203	70.4			
		TOTAL			607	77.3	.12		
15	<u>CODEFENDANTS</u>								
	No		0		328	76.8			
	Yes		1		279	77.8			
	TOTAL				607	77.3	.01	94.8	.897
16	<u>TYPE OF SENTENCE</u>								
	Simple		0		452	75.4			
	More Than One Type Offense, Concurrent		1		115	82.6			
	Consecutive		2		40	82.5			
	TOTAL				607	77.3	.07	96.1	.900
119		<u>TYPE OF SENTENCE</u>							
	Simple		0	1	452	75.4			
	Other		1,2	0	155	82.6			
	TOTAL				607	77.3	.07		

APPENDIX A (Cont.)  
POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
17	OFFENSE								
	Willful Homicide		01		5	80.0			
	Negligent Man-slaughter		02		0				
	Armed Robbery		10		35	80.0			
	Unarmed Robbery		11		4	75.0			
	Aggravated Assault		20		5	80.0			
	Burglary (Dwelling)		31		0				
	Burglary (Other)		32		20	75.0			
	Theft or Larceny, Except Vehicle		40		58	79.3			
	Vehicle Theft		50		179	65.9			
	Forgery, Fraud, Larceny by Check		60		66	77.3			
	Other Fraud		61		25	84.0			
	Rape, Forcible		70		2	50.0			
	Rape, Statutory		71		0				
	Other Sex Offenses								
	Against Juveniles		72		1	100			
	Prostitution and Pandering		73		3	100			
	All Other Sex Offenses Not Against Juveniles		74		1	100			
	Alcohol Law Violation		81		39	84.6			
	Narcotic Drug Laws Violation								

# APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
17	(Cont.)								
	Marijuana		82		17	88.2			
	Heroin		83		69	75.4			
	Other		84		9	100			
	Immigration Laws Violation		91		2	50.0			
	Counterfeiting		93		20	95.0			
	Kidnapping, Federal		94		2	100			
	Selective Service Laws Violation		95		27	96.3			
	National Firearms Act Violation		96		7	85.7			
	All Others		90		11	90.9			
	TOTAL				607	77.3	.24	96.8	.961
120	OFFENSE								
	Willful Homicide		01	1	5	80.0			
	Others		all others	0	602	77.2			
	TOTAL				607	77.3	.01		
121	OFFENSE								
	Negligent Manslaughter		02	1	0				
	Others		all others	0	607	77.3			
	TOTAL				607	77.3			

# APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
122		OFFENSE							
		Armed Robbery	10	1	35	80.0			
		Others	all others	0	572	77.1			
		TOTAL			607	77.3	.02		
123		OFFENSE							
		Unarmed Robbery	11	1	4	75.0			
		Others	all others	0	603	77.3			
		TOTAL			607	77.3	.00		
124		OFFENSE							
		Aggravated Assault	20	1	5	80.0			
		Others	all others	0	602	77.2			
		TOTAL			607	77.3	.01		
125		OFFENSE							
		Burglary	30,31,32	1	20	75.0			
		Others	all others	0	587	77.3			
		TOTAL			607	77.3	.01		

APPENDIX A (Cont.)

POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
126		OFFENSE							
		Theft or Larceny	40	1	58	79.3			
		Others	all others	0	549	77.0			
		TOTAL			607	77.3	.02		
127		OFFENSE							
		Vehicle Theft	50	1	179	65.9			
		Others	all others	0	428	82.0			
		TOTAL			607	77.3	.18		
128		OFFENSE							
		Forgery, Fraud	60,61	1	91	79.1			
		Others	all others	0	516	76.9			
		TOTAL			607	77.3	.02		
129		OFFENSE							
		All Sex Offenses	70-74	1	7	85.7			
		Others	all others	0	600	77.2			
		TOTAL			607	77.3	.02		



## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
130		<u>OFFENSE</u>							
		Narcotics Violations	80,82,83	1	95	80.0			
		Others	84 all others	0	512	76.8			
		TOTAL			607	77.3	.03		
131		<u>OFFENSE</u>							
		Alcohol Violations	81	1	39	84.6			
		Others	all others	0	568	76.8			
		TOTAL			607	77.3	.05		
132		<u>OFFENSE</u>							
		"Other" Offenses	90-96	1	69	92.8			
		Others	all others	0	538	75.3			
		TOTAL			607	77.3	.13		
133		<u>OFFENSE</u>							
		Property Offenses	30,31,32, 40,50,60, 61	1	348	72.1			
		Others	all others	0	259	84.2			
		TOTAL			607	77.3	.14		

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
134		OFFENSE							
		Major Person Offenses	01,02,70,72	1	8	75.0			
		Others	all others	0	599	77.3			
		TOTAL			607	77.3	.01		
135		OFFENSE							
		All Person Offenses	01,02,10,11,20,70-74	1	56	80.4			
		Others	all others	0	551	77.0			
		TOTAL			607	77.3	.02		
291		OFFENSE							
		Property Offense	30,31,32,40,50,60,61,93	0	368	73.4			
		Others	all others	1	239	83.3			
		TOTAL			607	77.3	.12		
18	WEAPON IN OFFENSE/ INJURY								
		None	0		538	77.1			
		Implied Only	1		5	80.0			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
18	(Cont.) Firearm: As Threat Firearm: Bodily Harm Knife: As Threat Knife: Bodily Harm Other: As Threat Other: Bodily Harm In Possession 0, 1, or 8 & Bodily Harm  TOTAL		2 3 4 5 6 7 8 9		35 7 1 1 3 3 12 2	82.9 100 0.0 100 66.7 33.3 83.3 0.0		98.1	.915
136		WEAPON IN OFFENSE None Weapon	0 all others	1 0	538 69	77.1 78.3			
		TOTAL			607	77.3	.01		
137		WEAPON IN OFFENSE None Implied Threat Bodily Harm	0 1 2,4,6,8 3,5,7,9	0 1 2 3	538 5 51 13	77.1 80.0 80.4 69.2			
		TOTAL			607	77.3	.04		

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
19	ASSAULT (COMMITMENT OFFENSE)								
	No		0		537	77.3			
	Yes		1		70	77.1			
	TOTAL				607	77.3	.00	98.7	.940
20	OFFENSE RATING								
	Bigamy		235		0				
	Prostitution		247		2	100			
	Walkaway		269		0				
	Minor Theft, Unplanned		275		0				
	Abnormal Sex, Adults, Mutual Consent		285		1	100			
	Checks, Own Name, Less Than or Equal to \$500		319		0				
	Possess Marijuana, Less Than or Equal to \$100		333		3	100			
	Forgery or Counterfeiting Less Than or Equal to \$500		335		44	75.0			
	Minor Theft, Planned		346		0				
	Simple Theft, Unplanned		354		0				
	Checks, Own Name, Greater Than \$500		389		0				

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
20	(Cont.)								
	Possess Heavy Narcotics Less Than or Equal to \$50		394		5	80.0			
	Theft, Unplanned		395		16	81.3			
	Car Theft, Unplanned		400		74	66.2			
	Burglary, No Weapon, Day-Time, Economic		406		2	100			
	Forgery or Counterfeiting More Than \$500		425		24	91.7			
	Possess Marijuana, More Than \$100		426		9	88.9			
	Confidence Game		461		0				
	Sell Marijuana, Adult		462		5	80.0			
	Normal Sex, Minor		467		0				
	Receiving Stolen Property		469		13	76.9			
	Sell Heavy Narcotics to Support Habit		480		30	83.3			
	Theft, Planned		484		66	80.3			
	Abortion		485		0				
	Car Theft, Planned		486		98	67.3			
	Manslaughter		490		0				
	Burglary, No Weapon, Day-Time, Other Crime								
	Planned		492		1	100			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
20	(Cont.)								
	Burglary, Weapon or Night-Time, Unplanned		494		6	66.7			
	Possess Heavy Narcotics, Greater Than \$50		496		23	69.6			
	Escape With Force		498		1	100			
	Abnormal Sex, Minor, Mutual Consent		558		0				
	Burglary, Weapon or Night-Time, Planned		631		9	66.7			
	Attempted Crime With Threat to Harm		644		0				
	Sell Marijuana, Minor		654		0				
	Criminal Act, Fear, No Injury		655		10	90.0			
	Criminal Act, Bodily Harm		692		1	100			
	Criminal Act, Weapon		696		34	79.4			
	Criminal Act, Injury		700		1	100			
	Sexual Act, Child, No Force		709		0				
	Sell Heavy Narcotics for Profit		716		21	81.0			
	Violence, "Spur of the Moment"		719		3	0.0			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
20	(Cont.)								
	Sexual Act, Adult, Force		736		2	50.0			
	Criminal Circumstances Causing Death		747		0				
	Sexual Act, Adult, Bodily Harm		762		0				
	Criminal Act, Fear, Disfigurement		775		1	0.0			
	Violence, "Spur of the Moment," Death		804		5	80.0			
	Sexual Act, Child, Force		805		2	100			
	Violence, Planned, Adult, Bodily Harm		852		3	100			
	Violence, Planned, Minor, Bodily Harm		863		0				
	Violence, Planned, Minor, Death		883		0				
	Violence, Planned, Adult, Death		387		0				
	All Others		000		92	88.0			
	TOTAL				607	77.3	.27	81.3	.951

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
138		OFFENSE RATING Poor Risk	275,319, 335,346, 354,389, 394,395, 400,406, 425,461, 469,480, 484,486, 492,494, 496,631						
		Others	all others	0 1	411 196	74.0 84.2			
		TOTAL			607	77.3	.11		
139		OFFENSE RATING Severity A	269,354 (or of- fense = 81 or 91)	1	41	82.9			
		Severity B	247,333, 335,395 426,484 (or of- fense=96)	2	147	80.3			
		Severity C	394,400, 425,469, 486,496, 716	3	258	71.3			
		Severity D	480,494, 631,700, 719,736	4	50	74.0			



# APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
139		(Cont.) Severity E	498,655, 692,696, 747,762 804,805, 887	5	53	83.0			
		Other	all others	6	58	89.7			
		TOTAL			607	77.3	.15		
21	DOLLAR VALUE (Burglary, Vehicle -Resale, Forgery, Fraud, Larceny, Possession of Drugs or Counterfeiting)								
	Under \$200		1		98	71.4			
	\$200-499		2		50	72.0			
	\$500-999		3		20	100			
	\$1,000-4,999		4		42	83.3			
	\$5,000-20,000		5		12	91.7			
	Over \$20,000		6		24	100			
	TOTAL				246	79.7	.27	93.5	.901
	Unknown		7		361				

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
140		DOLLAR VALUE Under \$1,000 or Unknown \$1,000 or Over	1,2,3,7 4,5,6	1 0	222 78	75.7 89.7			
		TOTAL			300	79.3	.15		
		Not Applicable			307				
292		DOLLAR VALUE Under \$1,000, Unknown, or Uncoded \$1,000 or Over	1,2,3,7 or blank 4,5,6	1 0	529 78	75.4 89.7			
		TOTAL			607	77.3	.11		
22	REASON FOR FIRST ARREST								
	Felony:								
	Homicide, Assault, or Sex		0		29	69.0			
	Burglary, Forgery, Checks		1		102	74.5			
	Robbery		2		18	61.1			
	Theft, Except Auto		3		93	69.9			
	Auto Theft		4		55	80.0			
	Narcotics		5		30	90.0			
	Other		6		65	89.2			
	Misdemeanor:								
	Drunk		7		30	76.7			
	Other		8		116	81.9			

## APPENDIX (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
22	(Cont.) Delinquent Child (under 18) No Information Military		9 11 12		34 0 11	61.8  100			
	TOTAL				583	77.4	.21	90.3	.891
	Unknown				24				
141		REASON FOR FIRST ARREST							
		Felony	0-6	0	392	76.8			
		Not Felony	all others	1	215	78.1			
		TOTAL			607	77.3	.02		
142		REASON FOR FIRST ARREST							
		Burglary, Forgery, Checks	1	0	102	74.5			
		Other	all others	1	505	77.8			
		TOTAL			607	77.3	.03		
143		REASON FOR FIRST ARREST							
		Robbery	2	0	18	61.1			

## APPENDIX (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
143		(Cont.) Other	all others	1	589	77.8			
		TOTAL			607	77.3	.07		
144		<u>REASON FOR FIRST ARREST</u>							
		Auto Theft	4	0	55	80.0			
		Other	all others	1	552	77.0			
		TOTAL			607	77.3	.02		
145		<u>REASON FOR FIRST ARREST</u>							
		Delinquent Child	9	0	34	61.8			
		Other	all others	1	573	78.2			
		TOTAL			607	77.3	.09		
23	<u>AGE AT FIRST ARREST</u>		0-12		53	64.2			
			13		27	63.0			
			14		38	65.8			
			15		40	77.5			
			16		55	72.7			
			17		57	86.0			



**CONTINUED**

**1 OF 6**

## APPENDIX (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point-Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
23	(Cont.)		18		45	71.1			
			19		43	81.4			
			20		41	87.8			
			21		34	76.5			
			22		30	76.7			
			23		19	73.7			
			24		24	79.2			
	25 or Over		25+		101	87.1			
	TOTAL				607	77.3	.20	93.5	.998
293		<u>AGE AT FIRST ARREST</u>	18 or less	0	315	72.4			
			19 or over	1	292	82.5			
		TOTAL			607	77.3	.12		
294		<u>AGE AT FIRST ARREST</u>	14 or less	1	118	64.4			
			15-18	2	197	77.2			
			19-24	3	191	80.1			
			25 or over	4	101	87.1			
		TOTAL			607	77.3	.17		

APPENDIX A (Cont.)  
POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
24	<u>AGE AT FIRST CONVICTION</u>		0-12		37	62.2			
			13		20	55.0			
			14		28	53.6			
			15		34	82.4			
			16		44	70.5			
			17		50	78.0			
			18		45	75.6			
			19		51	82.4			
			20		45	80.0			
			21		35	80.0			
			22		38	81.6			
			23		22	86.4			
			24		30	73.3			
			25+		128	85.9			
	TOTAL				607	77.3	.22	95.5	.999
295	<u>AGE AT FIRST CONVICTION</u>		22 or under	0	427	74.5			
			23 or over	1	180	83.9			
			TOTAL		607	77.3	.10		
296	<u>AGE AT FIRST CONVICTION</u>		14 or under	1	85	57.6			



## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
296		(Cont.)	15-22 23 or over	2 3	342 180	78.7 83.9			
		TOTAL			607	77.3	.20		
25	<u>AGE AT FIRST COMMITMENT</u>		0-12 13 14 15 16 17 18 19 20 21 22 23 24 25+		28 11 21 26 33 34 40 48 44 37 38 30 29 188	60.7 54.5 61.9 69.2 60.6 70.6 87.5 77.1 75.0 81.1 81.6 83.3 93.1 81.4			
	25 or Over								
	TOTAL				607	77.3	.21	94.8	.999
297		<u>AGE AT FIRST COMMITMENT</u>	20 or under	0	285	71.2			

## APPENDIX (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
297		(Cont.)	21 or over	1	322	82.6			
		TOTAL			607	77.3	.14		
298		<u>AGE AT FIRST COMMITMENT</u>	14 or under	1	60	60.0			
			15-20	2	225	74.2			
			21 or over	3	322	82.6			
		TOTAL			607	77.3	.17		
26	<u>LONGEST TIME FREE SINCE FIRST COMMITMENT</u>								
	None		1		152	90.8			
	Less Than or Equal to 6 Months		2		16	68.8			
	Less Than or Equal to 18 Months		3		92	71.7			
	Less Than or Equal to 36 Months		4		112	62.5			
	Less Than or Equal to 60 Months		5		98	75.5			
	More Than 60 Months		6		137	80.3			
	TOTAL				607	77.3	.23	90.3	.879

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial <i>r</i>	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson <i>r</i>
146		<u>LONGEST TIME FREE SINCE FIRST COMMITMENT</u>							
		Less Than or Equal to 60 Months	1,2,3,4,5	0	470	76.4			
		Over 60 Months	6	1	137	80.3			
		TOTAL			607	77.3	.04		
147		<u>LONGEST TIME FREE SINCE FIRST COMMITMENT</u>							
		Less Than or Equal to 60 Months	1,2,3,4,5 (and codes other than 0 for prior incarceration variable #31)	0	324	69.4			
		More Than 60 Months or No Prior Incarceration	6 (or 0 for prior incarceration)	1	283	86.2			
		TOTAL			607	77.3	.20		

APPENDIX A (Cont.)

POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
27	<u>LONGEST TIME SERVED ON ANY COMMITMENT</u>								
	None		1		150	92.0			
	Less Than or Equal to 6 Months		2		85	78.8			
	Less Than or Equal to 18 Months		3		125	70.4			
	Less Than or Equal to 36 Months		4		135	72.6			
	Less Than or Equal to 60 Months		5		68	63.2			
	More Than 60 Months		6		44	79.5			
	TOTAL				607	77.3	.23	91.6	.893
148	<u>LONGEST TIME SERVED ON ANY COMMITMENT</u>								
	None		1	1	150	92.0			
	Less Than or Equal to 6 Months		2	2	85	78.8			
	Less Than or Equal to 36 Months		3,4	3	260	71.5			
	Less Than or Equal to 60 Months		5	5	68	63.2			
	More Than 60 Months		6	6	44	79.5			
	TOTAL				607	77.3	.23		

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point-Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
299		LONGEST TIME SERVED ON ANY COMMITMENT							
		None, Less Than 6 Months	1,2 or 6	1	279	86.0			
		Others	3-5	0	328	69.8			
		TOTAL			607	77.3	.19		
28	PRIOR PRISON COMMITMENTS								
	None		0		284	84.2			
			1		115	75.7			
			2		95	66.3			
			3		49	71.4			
			4		29	72.4			
			5		13	53.8			
			6		10	90.0			
			7		5	60.0			
			8		4	50.0			
	9 or More		9		3	100			
	TOTAL				607	77.3	.20	95.5	.984
149		PRIOR PRISON COMMITMENTS							
			0	0	284	84.2			
			1	1	115	75.7			
			2	2	95	66.3			
			3	3	49	71.4			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
149		(Cont.)	4-9	4	64	70.3			
		TOTAL			607	77.3	.17		
150		<u>PRIOR PRISON COMMITMENTS</u>	0	1	284	84.2			
			all others	0	323	71.2			
		TOTAL			607	77.3	.15		
29	<u>OTHER PRIOR SENTENCES</u>		0		109	87.2			
	None		1		101	80.2			
			2		93	76.3			
			3		64	78.1			
			4		55	76.4			
			5		40	80.0			
			6		32	84.4			
			7		16	50.0			
			8		22	59.1			
	9 or More		9		75	66.7			
	TOTAL				607	77.3	.20	89.0	.988

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
151		<u>OTHER PRIOR SENTENCES</u>	0	0	109	87.2			
			1	1	101	80.2			
			2	2	93	76.3			
			3	3	64	78.1			
			4-9	4	240	71.7			
			TOTAL		607	77.3			
152		<u>OTHER PRIOR SENTENCES</u>	0	1	109	87.2			
			all others	0	498	75.1			
			TOTAL		607	77.3			
30	<u>SENTENCE WITH PROBATION</u> None		0		297	76.8			
			1		195	80.0			
			2		77	76.6			
			3		25	72.0			
			4		6	66.7			
			5		4	50.0			
			6		2	50.0			
			7		1	100			
			TOTAL		607	77.3			
							.09	98.7	.994

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
153		<u>SENTENCE WITH PRO-BATION</u>	0	1	297	76.8			
			all others	0	310	77.7			
		TOTAL			607	77.3	.01		
31	<u>PRIOR INCARCERATIONS</u>								
	None		0		147	91.8			
			1		94	80.9			
			2		61	78.7			
			3		58	70.7			
			4		54	79.6			
			5		48	64.6			
			6		39	66.7			
			7		28	71.4			
			8		25	68.0			
	9 or More		9		53	60.4			
	TOTAL				607	77.3	.25	87.7	.990
154		<u>PRIOR INCARCERATIONS</u>	0	0	147	91.8			
			1	1	94	80.9			
			2	2	61	78.7			
			3	3	58	70.7			



## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
154		(Cont.)	4-9	4	247	68.4			
		TOTAL			607	77.3	.23		
155		<u>PRIOR INCARCERATIONS</u>	0	1	147	91.8			
			all others	0	460	72.6			
		TOTAL			607	77.3	.20		
32	<u>PROBATION OR PAROLE REVOCATIONS</u>								
	None		0		345	82.3			
	Probation Revoked One or More Times		2		66	80.3			
	Parole Revoked One or More Times		3		160	64.4			
	Both Probation and Parole Revoked		4		36	80.6			
	TOTAL				607	77.3	.18	96.8	.946

## APPENDIX (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
156		<u>PROBATION OR PAROLE REVOCATIONS</u>	0	1	345	82.3			
			all others	0	262	70.6			
		TOTAL			607	77.3	.14		
300		<u>PROBATION OR PAROLE REVOCATIONS</u>							
		Parole Revoked One or More Times	3	0	160	64.4			
		Parole Not Revoked	all others	1	447	81.9			
		TOTAL			607	77.3	.18		
	<u>PRIOR CONVICTIONS</u>								
33	<u>WILLFUL HOMICIDE</u>								
	None		0		599	77.3			
			1		8	75.0			
	TOTAL				607	77.3	.01	100	1.00
34	<u>NEGLIGENT MAN-SLAUGHTER</u>								
	None		0		604	77.5			

# APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
34	(Cont.)								
	TOTAL		1		3 607	33.3 77.3	.07	100	.000
35	<u>ARMED ROBBERY</u>								
	None		0		538	77.0			
			1		56	78.6			
			2		9	100			
			3		3	33.3			
			4		1	100			
	TOTAL				607	77.3	.10	96.8	.876
159		<u>ARMED ROBBERY</u>							
			0	0	538	77.0			
			all others	1	69	79.7			
	TOTAL				607	77.3	.02		
36	<u>UNARMED ROBBERY</u>								
	None		0		566	77.7			
			1		34	73.5			
			2		7	57.1			
	TOTAL				607	77.3	.06	96.1	.758

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
160		<u>UNARMED ROBBERY</u>	0	0	566	77.7			
			all others	1	41	70.7			
		TOTAL			607	77.3	.04		
37	<u>AGGRAVATED ASSAULT</u>		0		505	77.6			
	None		1		77	76.6			
			2		17	70.6			
			3		1	100			
			4		4	75.0			
			5		0				
			6		0				
			7		1	0.0			
			8		0				
	9 or More		9		2	100			
	TOTAL				607	77.3	.09	98.1	.957
161		<u>AGGRAVATED ASSAULT</u>	0	0	505	77.6			
			all others	1	102	75.5			
		TOTAL			607	77.3	.02		
38	<u>BURGLARY</u>		0		411	80.3			
	None								

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
38	(Cont.)		1		109	73.4			
			2		51	74.5			
			3		25	72.0			
			4		8	25.0			
			5		2	0.0			
			6		0				
			7		0				
			8		1	100			
	TOTAL				607	77.3	.20	95.5	.935
162		<u>BURGLARY</u>	0	0	411	80.3			
			all others	1	196	70.9			
		TOTAL			607	77.3	.10		
39	<u>THEFT OR LARCENY EXCEPT AUTO</u>		0		336	79.8			
	None		1		149	77.9			
			2		60	73.3			
			3		37	64.9			
			4		11	100			
			5		11	36.4			
			6		3	66.7			
		TOTAL			607	77.3	.18	90.3	.905

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
163		<u>THEFT OR LARCENY EXCEPT AUTO</u>	0 all others	0 1	336 271	79.8 74.2			
		TOTAL			607	77.3	.07		
40	<u>AUTO THEFT</u> None		0 1 2 3 4 5 6 7 9		363 121 60 31 14 9 5 2 2	82.9 66.9 75.0 74.2 64.3 55.6 80.0 0.0 50.0			
	TOTAL				607	77.3	.21	94.2	.947
164		<u>AUTO THEFT</u>	0 all others	0 1	363 244	82.9 68.9			
		TOTAL			607	77.3	.16		

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
41	FORGERY, FRAUD, OR LARCENY BY CHECK								
	None		0		426	79.6			
			1		101	74.3			
			2		39	74.4			
			3		16	62.5			
			4		8	62.5			
			5		9	77.8			
			6		3	33.3			
			7		2	50.0			
			8		0				
	9 or More		9		3	66.7			
	TOTAL				607	77.3	.12	98.7	.988
165	FORGERY, FRAUD, OR LARCENY BY CHECK								
			0	0	426	79.6			
			all others	1	181	71.8			
	TOTAL				607	77.3	.08		
42	OTHER FRAUD								
	None		0		550	78.0			
			1		44	68.2			
			2		8	62.5			
			3		3	100			
			4		1	100			
			5		0				
			6		0				

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
42	(Cont.)		7		0				
	9 or More		8		0				
			9		1	100			
	TOTAL				607	77.3	.09	98.7	.974
166		<u>OTHER FRAUD</u>	0	0	550	78.0			
			all others	1	57	70.2			
	TOTAL				607	77.3	.05		
43	<u>RAPE, FORCIBLE</u>		0		602	77.6			
	None		1		5	40.0			
	TOTAL				607	77.3	.08	100	1.00
44	<u>RAPE, STATUTORY</u>		0		600	77.2			
	None		1		7	85.7			
	TOTAL				607	77.3	.02	100	.000



APPENDIX A (Cont.)

POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
45	<u>OTHER SEX OFFENSES AGAINST JUVENILES</u> None		0 1 2 3		598 8 0 1	77.1 87.5  100			
	TOTAL				607	77.3	.04	100	1.00
169		<u>OTHER SEX OFFENSES AGAINST JUVENILES</u>	0 all others	0 1	598 9	77.1 88.9			
	TOTAL				607	77.3	.03		
46	<u>PROSTITUTION AND PANDERING</u> None		0 1 2		599 6 2	77.3 66.7 100			
	TOTAL				607	77.3	.04	100	1.00
170		<u>PROSTITUTION AND PANDERING</u>	0	0	599	77.3			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
170		(Cont.)							
			all others	1	8	75.0			
		TOTAL			607	77.3	.01		
47	ALL OTHER SEX OFFENSES NOT AGAINST JUVENILES								
	None		0		599	77.1			
			1		8	87.5			
	TOTAL				607	77.3	.03	99.4	.705
48	NARCOTIC DRUG LAW VIOLATION								
	None		0		483	77.6			
			1		68	77.9			
			2		30	80.0			
			3		14	64.3			
			4		9	55.6			
			5		2	100			
			6		1	100			
	TOTAL				607	77.3	.09	98.7	.976
172		NARCOTIC DRUG LAW VIOLATION	0	0	483	77.6			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
172		(Cont.)	all others	1	124	75.8			
		TOTAL			607	77.3	.02		
49	<u>ALCOHOL LAW VIOLATIONS</u>								
	None		0		553	76.5			
			1		21	90.5			
			2		9	55.6			
			3		6	83.3			
			4		5	80.0			
			5		2	100			
			6		4	100			
			7		1	100			
			8		3	100			
	9 or More		9		3	100			
	TOTAL				607	77.3	.12	99.4	.989
173	<u>ALCOHOL LAW VIOLATIONS</u>								
			0	0	553	76.5			
			all others	1	54	85.2			
	TOTAL				607	77.3	.06		

## APPENDIX (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
50	<u>IMMIGRATION LAW VIOLATION</u> None		0 1 2		603 2 2	77.3 100 50.0			
	TOTAL				607	77.3	.05	100	.000
174	<u>IMMIGRATION LAW VIOLATION</u>		0 all others	0 1	603 4	77.3 75.0			
	TOTAL				607	77.3	.00		
51	<u>COUNTERFEITING</u> None		0 1 2		587 19 1	76.5 100 100			
	TOTAL				607	77.3	.10	100	1.00
175	<u>COUNTERFEITING</u>		0 all others	0 1	587 20	76.5 100			
	TOTAL				607	77.3	.10		

## APPENDIX (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
52	<u>SELECTIVE SERVICE LAW VIOLATION</u>								
	None		0		579	76.5			
			1		28	92.9			
	TOTAL				607	77.3	.08	100	.100
53	<u>DRUNK OR DRUNK DRIVING</u>								
	None		0		469	78.3			
			1		61	75.4			
			2		25	76.0			
			3		13	61.5			
			4		6	83.3			
			5		10	70.0			
			6		4	75.0			
			7		2	100			
			8		6	83.3			
	9 or More		9		11	63.6			
	TOTAL				607	77.3	.09	97.4	.970
177		<u>DRUNK OR DRUNK DRIVING</u>							
			0	0	469	78.3			
			all others	1	138	73.9			
		TOTAL			607	77.3	.04		

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point-Biserial $r$	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson $r$
54	<u>VAGRANCY/DISORDERLY CONDUCT</u>								
	None		0		451	78.3			
			1		99	74.7			
			2		30	70.0			
			3		8	100			
			4		7	85.7			
			5		7	57.1			
			6		1	0.0			
			7		1	100			
			8		2	50.0			
	9 or More		9		1	100			
	TOTAL				607	77.3	.13	91.0	.872
178	<u>VAGRANCY/DISORDERLY CONDUCT</u>								
			0	0	451	78.3			
			all others	1	156	74.4			
	TOTAL				607	77.3	.04		
55	<u>JUVENILE DELINQUENCY</u>								
	None		0		560	78.5			
			1		34	67.6			
			2		9	44.4			
			3		1	100			
			4		2	50.0			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
55	(Cont.)		5		1	100			
	TOTAL				607	77.3	.12	95.5	.934
179		<u>JUVENILE DELINQUENCY</u>							
			0	0	559	78.5			
			all others	1	48	62.5			
		TOTAL			607	77.3	.10		
56	<u>MILITARY CONVIC-TIONS</u> None		0		539	76.8			
			1		35	82.9			
			2		17	82.4			
			3		5	80.0			
			4		6	66.7			
			5		3	66.7			
			6		1	100			
			7		1	100			
	TOTAL				607	77.3	.06	98.1	.898
180		<u>MILITARY CONVIC-TIONS</u>							
			0	0	539	76.8			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
180		(Cont.)	all others	1	68	80.9			
		TOTAL			607	77.3	.03		
57	ALL OTHERS (INCLUDING TRAFFIC OFFENSES)								
	None		0		310	78.7			
			1		168	78.6			
			2		64	67.2			
			3		30	83.3			
			4		17	82.4			
			5		9	44.4			
			6		3	100			
			7		3	100			
			8		0				
	9 or More		9		3	33.3			
	TOTAL				607	77.3	.16	87.7	.945
181		ALL OTHERS (INCLUDING TRAFFIC OFFENSE)							
			0	0	310	78.7			
			all others	1	297	75.8			
		TOTAL			607	77.3	.04		



## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point-Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
183		<u>PRIOR PERSON CONVICTIONS</u>							
		Total of All Prior Convictions for These Offenses: Willful Homicide, Negligent Manslaughter, Armed Robbery, Unarmed Robbery, Aggravated Assault, Sex Offenses.							
				0	396	77.3			
				1	138	79.7			
				2	44	75.0			
				3	16	68.8			
				4	7	57.1			
				5	3	100			
				7	1	0.0			
		More Than 9		9	2	100			
		TOTAL			607	77.3	.11		
184		<u>PRIOR PERSON CONVICTIONS</u>							
			0	1	396	77.3			
			all others	0	211	77.3			
		TOTAL			607	77.3	.00		

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
185		<u>PRIOR PROPERTY CONVICTIONS</u>							
		Total of All Prior Convictions for These Offenses: Burglary, Theft or Larceny, Auto Theft, Forgery or Fraud, Counterfeiting.							
				0	128	87.5			
				1	101	84.2			
				2	110	80.0			
				3	70	75.7			
				4	56	66.1			
				5	41	75.6			
				6	42	71.4			
				7	23	65.2			
				8	13	46.2			
		9 or More		9	23	52.2			
		TOTAL			607	77.3	.23		
186		<u>PRIOR PROPERTY CONVICTIONS</u>							
			0	1	128	87.5			
			all others	0	479	74.5			
		TOTAL			607	77.3	.13		

# APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
187		OFFENSE VARIETY Number of Non-Zero Entries in Different Prior Conviction Offense Classifications.		1	94	90.4			
				2	102	76.5			
				3	125	80.0			
				4	102	73.5			
				5	86	76.7			
				6	64	67.2			
				7	25	68.0			
				8	6	33.3			
				9	2	100			
				10	1	100			
		TOTAL			607	77.3		.19	
188		BURGLARY SPECIALIST 2 or More Burglary Convictions All Others		1	87	67.8			
				0	520	78.8			
		TOTAL			607	77.3		.09	

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
189		<u>ROBBERY SPECIALIST</u>		1 0	26 581	76.9 77.3			
		2 or More Armed or Unarmed Robbery Convictions							
		All Others							
		TOTAL			607	77.3	.00		
190		<u>ASSAULT SPECIALIST</u>		1 0	9 598	66.7 77.4			
		2 or More Willful Homicide, Negligent Manslaughter, or Aggravated Assault Convictions							
		All Others							
		TOTAL			607	77.3	.03		
191		<u>AUTO THEFT SPECIALIST</u>		1 0	123 484	70.7 78.9			
		2 or More Auto Theft Convictions							
		All Others							
		TOTAL			607	77.3	.08		

APPENDIX A (Cont.)  
POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
192		FORGERY, FRAUD, OR LARCENY BY CHECK							
		2 or More Forgery, Fraud or Larceny by Check Convictions		1	80	68.8			
		All Others		0	527	78.6			
		TOTAL			607	77.3	.08		
193		THEFT SPECIALIST							
		2 or More Theft or Larceny Except Auto or Fraud Convictions		1	122	69.7			
		All Others		0	485	79.2			
		TOTAL			607	77.3	.09		
194		RAPE SPECIALIST							
		2 or More Forcible Rape Convictions		1	0				
		All Others		0	607	77.3			
		TOTAL			607	77.3			
58	FAMILY CRIMINAL RECORD								
	No		0		470	76.8			

APPENDIX A (Cont.)

POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
58	(Cont.) Yes		1		137	78.8			
	TOTAL				607	77.3	.02	96.1	.895
182		<u>FAMILY CRIMINAL RECORD</u>							
		No	0	0	470	76.8			
		Yes	1	1	137	78.8			
	TOTAL				607	77.3	.02		
59	<u>LIVING ARRANGEMENT BEFORE COMMITMENT</u>								
	With Others:								
	Parents or Guardian		1		93	67.7			
	Wife and/or Children		2		151	84.8			
	Paramour		3		61	83.6			
	Other(s)		4		39	82.1			
	Alone:								
	Fixed Abode		5		67	86.6			
	No Fixed Abode		6		71	77.5			
	Other:								
	Institution		7		79	59.5			
	Military		8		11	72.7			
	TOTAL				572	77.3	.23	80.6	.774
	No Information		9		35				

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
195		<u>LIVING ARRANGEMENT BEFORE COMMITMENT</u>							
		Wife and/or Children	2	1	151	84.8			
		Others	all others	0	456	74.8			
		TOTAL			607	77.3	.10		
196		<u>LIVING ARRANGEMENT BEFORE COMMITMENT</u>							
		Parents or Guardian	1	1	93	67.7			
		Others	all others	0	514	79.0			
		TOTAL			607	77.3	.10		
197		<u>LIVING ARRANGEMENT BEFORE COMMITMENT</u>							
		Alone, No Fixed Abode	6	0	71	77.5			
		Others	all others	1	536	77.2			
		TOTAL			607	77.3	.00		
60	ALCOHOL Use Denied or Unknown		0		244	80.3			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial <i>r</i>	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson <i>r</i>
60	(Cont.) Use Contributing to Offense "Alcoholic"		1		105	79.0			
			2		8	62.5			
			3		250	74.0			
	TOTAL				607	77.3	.08	89.0	.828
198		ALCOHOL							
		None	0	1	244	80.3			
		Some	all others	0	363	75.2			
	TOTAL				607	77.3	.06		
199		ALCOHOL							
		None	0	0	244	80.3			
		Some	1,2	1	113	77.9			
		Alcoholic	3	2	250	74.0			
	TOTAL				607	77.3	.07		
200		ALCOHOL							
		Alcoholic	3	0	250	74.0			
			all others	1	357	79.6			
	TOTAL				607	77.3	.07		



APPENDIX A (Cont.)

POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
61	<u>DRUGS</u>								
	ANY DRUG USE		0		427	79.6			
	No Known Use		blank		180	71.7			
	Some Use								
	TOTAL				607	77.3	.09	94.8	.887
62	<u>MARIJUANA</u>								
	Marijuana		1		74	73.0			
	No Marijuana Use		blank		533	77.9			
	TOTAL				607	77.3	.04	98.1	.930
63	<u>STIMULANTS, HALLUCINOGENS</u>								
	Stimulants or Hallucinogens		2		44	79.5			
	No Stimulants or Hallucinogens Use		blank		563	77.1			
	TOTAL				607	77.3	.02	98.7	.910
64	<u>SEDATIVES</u>								
	Sedatives, Including Barbiturates		3		36	61.1			

APPENDIX A (Cont.)

POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
64	(Cont.) No Sedatives, Including Barbiturates Use		blank		571	78.3			
	TOTAL				607	77.3	.10	95.5	.734
65	<u>OPIATES</u>								
	Opiates and Synthetic Substitutes		4		113	71.7			
	No Opiates and Synthetic Substitutes Use		blank		494	78.5			
	TOTAL				607	77.3	.06	97.4	.917
66	<u>OTHER DRUGS</u>								
	Other Drugs		5		14	71.4			
	No Other Drug Use		blank		593	77.4			
	TOTAL				607	77.3	.02	96.8	.272
67	<u>GLUE SNIFFING</u>								
	Glue Sniffing		6		7	85.7			
	No Glue Sniffing Use		blank		600	77.2			
	TOTAL				607	77.3	.02	99.4	.797

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
201		ANY DRUG USE No Known Use Some Use  TOTAL	0 blank	1 0	427 180 607	79.6 71.7 77.3	.09		
202		MARIJUANA/GLUE SNIFFING No Known Use or Marijuana or Glue Sniffing Any Use  TOTAL	0,1,6 blank	1 0	444 163 607	79.5 71.2 77.3	.09		
68	MENTAL HOSPITAL CONFINEMENT No Yes  TOTAL		0 1		559 48 607	77.8 70.8 77.3	.04	100	1.00
69	LONGEST JOB IN FREE COMMUNITY None Less Than or Equal to One Year Less Than or Equal to Two Years		0 1 2		8 211 93	25.0 74.4 74.2			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
69	(Cont.) Less Than or Equal to Three Years Less Than or Equal to Four Years More Than Four Years  TOTAL  Unknown		3 4 5		44 28 107 491 116	79.5 89.3 87.9 77.8			
203		LONGEST JOB IN FREE COMMUNITY Less Than or Equal to One Year or Unknown Less Than or Equal to Two Years  TOTAL	0,1,9 all others	0 1	335 272 607	73.4 82.0 77.3	.22  .10	80.0	.737
301		LONGEST JOB IN FREE COMMUNITY None or Unknown Less Than or Equal to One Year Less Than or Equal to Two Years Less Than or Equal to Three Years	0,9 1 2 3	0 1 2 3	124 211 93 44	71.8 74.4 74.2 79.5			

APPENDIX A (Cont.)

POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
301		(Cont.) Less Than or Equal to Four Years Greater Than Four Years  TOTAL	4 5	4 5	28 107 607	89.3 87.9 77.3	.15		
70	EMPLOYMENT IN LAST TWO YEARS OF CIVILIAN LIFE More Than 25% of Time, or Student or Unemployable 75% of Time or More Less Than 26% of Time, and Not Student or Unemployable 75% of Time  TOTAL  Unknown		1 2 9		312 68 380 227	83.3 70.6 81.1	.12	71.0	.517
204		EMPLOYMENT IN LAST TWO YEARS OF CIVILIAN LIFE Short or Unknown	2,9	0	295	70.8			

# APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New-Item Description	Old Values	New Values	N	Percent Success	Phi or Point-Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
204		(Cont.) Longer	1	1	312	83.3			
		TOTAL			607	77.3	.15		
71	MILITARY DISCHARGE								
	No Military History		0		337	75.7			
	Honorable		1		116	86.2			
	General		2		19	73.7			
	Medical		3		19	68.4			
	Other Than Honorable		4		102	73.5			
	Not Discharged		5		5	80.0			
	TOTAL				598	77.1	.11	96.8	.945
	Not Known		9		9				
205		MILITARY DISCHARGE							
	None		0	0	337	75.7			
	Honorable		1	1	116	86.2			
	all others			2	154	74.0			
	TOTAL				607	77.3	.10		
302		MILITARY DISCHARGE							
	Honorable		1	1	116	86.2			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
302		(Cont.) None, All Others	all others	0	491	75.2			
		TOTAL			607	77.3	.10		
.72	<u>BETA I.Q.</u>		70-79	1	21	71.4			
			80-89	2	52	71.2			
			90-99	3	113	80.5			
			100-109	4	182	76.9			
			110-119	5	128	75.8			
			120-129	6	48	81.3			
			130+	7	8	100			
	TOTAL				552	77.4	.10 (.07)	98.7	1.000
	Unknown		000		55				
73	<u>TOTAL NUMBER OF CONVICTIONS</u>		1		64	93.8			
			2		56	83.9			
			3		70	85.7			
			4		60	75.0			
			5		57	71.9			
			6		52	76.9			
			7		40	80.0			
			8		35	82.9			
			9		32	62.5			

# APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
73	(Cont.)								
			10		25	56.0			
			11		27	74.1			
			12		20	65.0			
			13		16	62.5			
			14		9	77.8			
	15 or More		15+		44	70.5			
	TOTAL				607	77.3	.23(-.15)	82.6	.989
303		TOTAL NUMBER OF CONVICTIONS							
		One	1	1	64	93.8			
		More Than One	all others	0	543	75.3			
		TOTAL			607	77.3	.14		
74	NUMBER OF MONTHS UNDER SUPERVISION (PREVIOUS)								
			1		5	80.0			
			2		9	55.6			
			3		13	46.2			
			4		8	87.5			
			5		9	55.6			
			6		3	33.3			
			7		8	100			
			8		6	66.7			
			9		2	100			



APPENDIX A (Cont.)  
POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
74	(Cont.)		10		9	55.6			
			11		4	75.0			
			12		3	33.3			
			13		2	100			
			14		2	100			
			15		1	0.0			
			17		4	100			
			19		4	50.0			
			20		1	0.0			
			21		3	66.7			
			23		1	100			
			24		1	100			
			26		2	100			
			32		1	100			
			33		1	0.0			
			37		2	50.0			
			70		1	100			
	TOTAL				105	66.7	.51 (.06)	99.4	1.000
	Not Coded				502				
75	PAROLE PERFORMANCE (PREVIOUS)								
	Continued on Parole (No Difficulty or Sentences Less Than 60 Days)		0		1	100			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
75	(Cont.) Continued on Parole [New Minor Conviction(s)]		1		0				
	Absconder		2		0				
	Returned to Prison --Technical Violation [No New Conviction(s) and Not in Lieu of Prosecution]		3		32	78.1			
	Returned to Prison --Technical Violation [New Minor or Lesser Conviction(s) or in Lieu of Prosecution on New Minor or Lesser Offense(s)]		4		27	66.7			
	Returned to Prison --Technical Violation [In Lieu of Prosecution on New Major Offense(s)]		5		10	70.0			
	Returned to Prison --No Violation Recommitted to Prison--New Major Conviction(s) (Same Juris-		6		0				

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
75	(Cont.) diction) Recommitted to Prison--New Major Conviction (s)(Any Other Jurisdiction) Other Return to Prison Continued on Parole [New Major Conviction (s)]		7		14	64.3			
			8		21	47.6			
			9		0				
			-		0				
	TOTAL				105	66.7	.24	98.1	.949
	Not Applicable				502				
207		PAROLE PERFORMANCE (PREVIOUS)							
		Success	0,1,6	1	1	100			
		Failure	all others	0	104	66.3			
		TOTAL			105	66.7	.07		
	Not Applicable				502				
76	<u>SAT</u>		4.1-5.0	1	47	70.2			
			5.1-6.0	2	64	71.9			
			6.1-7.0	3	75	74.7			
			7.1-8.0	4	64	85.9			

APPENDIX A (Cont.)  
POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
76	(Cont.)		8.1-9.0	5	81	74.1			
			9.1-10.0	6	55	70.9			
			10.1-11.0	7	51	78.4			
			11.1-12.0	8	34	88.2			
			12.1-13.0	9	16	93.8			
			13.1+	10	5	100			
	TOTAL				492	77.0	.16(.04)	91.0	.987
	Unknown		000		115				

APPENDIX A (Cont.)

POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
77	<u>LAST CUSTODY CLASSIFICATION</u> Maximum Close Medium Minimum Work Release  TOTAL  Unknown		1 2 3 4 6		0 75 117 205 101  498  109	 74.7 78.6 80.0 81.2  79.1	      .05	76.8	.701
208	<u>LAST CUSTODY CLASSIFICATION</u> Minimum or Work Release   TOTAL		4,6 all others	1  0	306 301 607	80.4 74.1 77.3	  .08		
78	<u>ON-THE-JOB TRAINING</u> None or Unknown Less Than or Equal to 5 Months More Than 5 Months  TOTAL		0 1 2		456 54 97 607	77.6 75.9 76.3 77.3	   .02	85.8	.699

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
209		ON-THE-JOB TRAINING							
		None or Unknown	0	0	456	77.6			
		Any	1,2	1	151	76.2			
		TOTAL			607	77.3	.02		
79	EDUCATION PROGRAM								
	No or Unknown		0		370	75.7			
	Yes		1		186	80.6			
	G.E.D.		2		51	76.5			
	TOTAL				507	77.3	.05	92.3	.869
210		EDUCATION PROGRAM							
	No or Unknown		0	0	370	75.7			
	Yes or G.E.D.		1,2	1	237	79.7			
	TOTAL				607	77.3	.05		
80	NUMBER OF PAROLE HEARINGS								
	None		0		67	79.1			
	First		1		255	74.9			
	Second		2		202	80.2			
	Third		3		63	74.6			
	Fourth		4		11	81.8			
	Fifth		5		6	66.7			
	Sixth		6		1	100			



**CONTINUED**

**2 OF 6**



## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
80	(Cont.) Seventh Eighth		7 8		1 1	100 100			
	TOTAL				607	77.3	.08	97.4	.965
211		<u>NUMBER OF PAROLE HEARINGS</u>							
		First	1	1	255	74.9			
		Not First	all others	0	352	79.0			
	TOTAL				607	77.3	.05		
81	<u>PAROLE ADVISOR OBTAINED (YCA ONLY)</u>								
	No		0		158	86.1			
	Yes		1		60	85.0			
	TOTAL				218	85.8	.01	98.7	.977
	Not Applicable		9		389				
212		<u>PAROLE ADVISOR OBTAINED</u>							
		No or Not Applicable	0,9	0	547	76.4			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
212		(Cont.) Yes	1	1	60	85.0			
		TOTAL			607	77.3	.06		
82	PLANNED LIVING ARRANGEMENT								
	With Others:								
	Parents or Guardian		1		163	73.0			
	Wife and/or Children		2		130	83.8			
	Paramour		3		24	91.7			
	Other(s)		4		93	80.6			
	Alone:								
	Fixed Abode		5		101	76.2			
	No Fixed Abode		6		9	88.9			
	Other:								
	Institution		7		0				
	Military		8		1	100			
	TOTAL				521	78.9	.13	79.4	.738
	No Information		9		86				
213		PLANNED LIVING ARRANGEMENT							
		Wife and/or Children	2	1	130	83.8			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
213		(Cont.)	all others	0	477	75.5			
		TOTAL			607	77.3	.08		
214		<u>PLANNED LIVING ARRANGEMENT</u> Parents or Guardian	1 all others	1 0	163 444	73.0 78.8			
		TOTAL			607	77.3	.06		
215		<u>PLANNED LIVING ARRANGEMENT</u> Parents or Guardian Wife and/or Children	1 2 all others	1 2 3	163 130 314	73.0 83.8 76.8			
		TOTAL			607	77.3	.09		
83	<u>TYPE OF DECISION</u> Adult, Regular Hearing		0		295	76.3			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
83	(Cont.)								
	Adult, Regular Review		1		121	80.2			
	Adult, Intermediate Hearing		2		82	74.4			
	Adult, Intermediate Review		3		93	77.4			
	Youth Corrections Act Hearing		4		0				
	Youth Corrections Act Review		5		0				
	Juvenile Delinquency Act Hearing		6		0				
	Juvenile Delinquency Act Review		7		0				
	Narcotic Addict Rehabilitation Act Hearing		8		11	90.9			
	Narcotic Addict Rehabilitation Act Review		9		5	80.0			
	TOTAL				607	77.3	.06	99.4	.992
216		TYPE OF DECISION							
		Adult, Regular	0,1	0	416	77.4			
		Adult, Intermediate	2,3	2	175	76.0			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
216		(Cont.) YCA FJDA NARA  TOTAL	4,5 6,7 8,9	4 6 8	0 0 16  607	87.5   77.3	   .04		
218		TYPE OF DECISION Adult YCA Others  TOTAL	0,1,2,3 4,5 6,7,8,9	0 1 2	591 0 16  607	77.0  87.5  77.3	   .04		
85	ESCAPE HISTORY None Prior Present Both  TOTAL		0 1 2 3		487 96 21 3  607	79.3 70.8 66.7 33.3  77.3	    .11	96.8	.898
220		ESCAPE HISTORY None Any  TOTAL	0 1,2,3	1 0	487 120  607	79.3 69.2  77.3	   .10		

APPENDIX A (Cont.)  
POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
86	<u>ASSAULTIVE INFRAC-TIONS</u>								
	None		0		578	77.7			
	One		1		24	66.7			
	Two		2		3	66.7			
	Three or More		3		2	100			
	TOTAL				607	77.3	.06	98.1	.855
221		<u>ASSAULTIVE INFRAC-TIONS</u>							
	None		0	1	578	77.7			
	Any		1,2,3	0	29	69.0			
	TOTAL				607	77.3	.04		
87	<u>PRISON PUNISHMENT</u>								
	None		0		453	79.2			
	One		1		96	74.0			
	Two		2		30	66.7			
	Three or More		3		28	67.9			
	TOTAL				607	77.3	.09	90.3	.792
222		<u>PRISON PUNISHMENT</u>							
	None		0	1	453	79.2			
	Any		1,2,3	0	154	71.4			
	TOTAL				607	77.3	.08		

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
88	<u>TYPE OF RELEASE</u> Parole Mandatory Release Expiration		1		211	86.7			
			2		237	75.9			
			3		159	66.7			
	TOTAL				607	77.3	.19	100	1.00
223	<u>TYPE OF RELEASE</u> Parole or Mandatory Release Expiration		1,2	0	448	81.0			
			3	1	159	66.7			
	TOTAL				607	77.3	.15		
273	<u>AGE AT ADMISSION</u> In Years at Last Birthday; Date of Admission Minus Birthdate.		16-17	1	1	100			
			18	2	10	70.0			
			19	3	14	78.6			
			20	4	18	72.2			
			21-24	5	96	86.5			
			25-29	6	132	66.7			
			30-34	7	97	75.3			
			35-40	8	96	80.2			
			41-50	9	92	78.3			
			51-60	10	40	82.5			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
273	(Cont.)		61+	11	11	100			
	TOTAL				607	77.3	.17(.06)		
304		<u>AGE AT ADMISSION</u>	24 and under	1	139	82.7			
			25-29	2	132	66.7			
			30 and over	3	336	79.2			
		TOTAL			607	77.3	.14		
274	<u>AGE AT RELEASE</u> In Years at Last Birthday; Age at Release Minus Birthdate.		18	2	1	100			
			19	3	5	80.0			
			20	4	8	62.5			
			21-24	5	82	80.5			
			25-29	6	113	78.8			
			30-34	7	119	66.4			
			35-40	8	96	79.2			
			41-50	9	116	79.3			
			51-60	10	53	81.1			
			61+	11	14	100			
	TOTAL				607	77.3	.16(.07)		



## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
305		<u>AGE AT RELEASE</u>	29 and under	1	209	78.9			
			30-34	2	119	66.4			
			35 and over	3	279	80.6			
		TOTAL			607	77.3	.13		
275	<u>TIME SERVED</u> In Months; Date of Release Minus Date of Admission.		0- 6	0	18	72.2			
			7- 9	1	22	77.3			
			10-12	2	73	71.2			
			13-15	3	83	77.1			
			16-18	4	97	77.3			
			19-24	5	91	82.4			
			25-36	6	105	71.4			
			37+	7	118	83.1			
	TOTAL				607	77.3	.11(.05)		
306		<u>TIME SERVED</u>	0-12	1	113	72.6			
			13-18	2	180	77.2			
			19-24	3	91	82.4			
			25-36	4	105	71.4			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
306		(Cont.)	over 36	5	118	83.1			
		TOTAL			607	77.3	.11		
276	SENTENCE LENGTH In Months; Expires Full Term Minus Date Sentence Began		13-18 19-24 25-30 31-36 37-60 61-96 97+	0 1 2 3 4 5 6	54 78 27 121 155 85 87	68.5 74.4 88.9 76.0 80.0 71.8 83.9			
	TOTAL				607	77.3	.12		
277	TIME SERVED BEYOND ELIGIBILITY In Months; Date of Release Minus Min- imum Parole Eligi- bility.		0- 6 7- 9 10-12 13-15	0 1 2 3	87 79 100 79	85.1 77.2 71.0 72.2			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
277	(Cont.)		16-18 19-24 25-36 37+	4 5 6 7	48 67 70 29	81.3 80.6 77.1 65.5			
	TOTAL				559	76.9	.12		
	Not Applicable				48				
307		<u>TIME SERVED BEYOND ELIGIBILITY</u>	0- 9 10-15 16 and over	1 2 3	166 179 214	81.3 71.5 77.6			
	TOTAL				559	76.7	.09		
	Not Applicable				48				
278	<u>TIME REMAINING</u> In Months; Expires Full Term Minus Date of Release.		0- 6 7- 9 10-12 13-15 16-18	0 1 2 3 4	164 64 77 38 33	67.7 73.4 68.8 86.8 72.7			

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Bi-serial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
278	(Cont.)		19-24 25-36 37+	5 6 7	72 63 96	80.6 87.3 91.7			
	TOTAL				607	77.3	.22		
308		<u>TIME REMAINING</u>	18 or less 19 or more	1 0	376 231	71.3 87.0			
		TOTAL			607	77.3	.18		
282	<u>AGE PER CONVICTION</u> Age at Admission Divided by Total Number Convictions		0.0- 3.0 3.1- 4.0 4.1- 6.0 6.1- 9.0 9.1-15.0 15.1-20.0 20.1+	0 1 2 3 4 5 6	93 89 139 107 90 26 63	65.6 76.4 69.8 80.4 83.3 84.6 95.2			
	TOTAL				607	77.3	.21		

## APPENDIX A (Cont.)

## POTENTIAL PREDICTOR VARIABLES AND THEIR RELIABILITY

Variable Number	Description	New Item Description	Old Values	New Values	N	Percent Success	Phi or Point Biserial r	Reliability	
								Percent Agreement	Coefficient of Agreement or Pearson r
309		AGE PER CONVICTION							
			6.0 or less	0	321	70.4			
			more than 6.0	1	286	85.0			
		TOTAL			607	77.3	.17		

APPENDIX B

MEANS, STANDARD DEVIATIONS AND  
INTERCORRELATIONS OF PREDICTOR VARIABLES  
IN THE CONSTRUCTION SAMPLE

## APPENDIX B (continued)

VARIABLE	MEAN	STANDARD DEV	CASES
VAR013	9.2652	2.7974	607
VAR024	21.0873	7.7213	607
VAR025	22.9687	8.4569	607
VAR028	1.2965	1.7276	607
VAR029	3.3839	2.9844	607
VAR031	3.2175	2.9599	607
VAR040	0.8188	1.3607	607
VAR064	0.1779	0.7092	607
VAR073	6.7578	5.3777	607
VAR085	0.2422	0.5318	607
VAR087	0.3954	0.7847	607
VAR111	0.5058	0.9332	607
VAR119	0.7446	0.4364	607
VAR127	0.2949	0.4564	607
VAR147	0.4662	0.4993	607
VAR149	1.1664	1.3681	607
VAR150	0.4679	0.4994	607
VAR151	2.3707	1.5615	607
VAR152	0.1796	0.3841	607
VAR154	2.2702	1.6668	607
VAR155	0.2422	0.4288	607
VAR156	0.5684	0.4957	607
VAR162	0.3229	0.4680	607
VAR164	0.4020	0.4907	607
VAR165	0.2982	0.4578	607
VAR179	0.0791	0.2701	607
VAR185	2.7743	2.4889	607
VAR186	0.2109	0.4083	607
VAR187	3.5354	1.8153	607
VAR188	0.1433	0.3507	607
VAR191	0.2026	0.4023	607
VAR192	0.1318	0.3385	607
VAR193	0.2010	0.4011	607
VAR195	0.2488	0.4327	607
VAR196	0.1532	0.3605	607
VAR201	0.7035	0.4571	607
VAR202	0.7315	0.4436	607
VAR203	0.4481	0.4977	607
VAR208	0.5041	0.5004	607
VAR213	0.2142	0.4106	607
VAR220	0.8023	0.3986	607
VAR222	0.7463	0.4355	607
VAR251	0.7727	0.4195	607
VAR276	60.0066	60.1112	607
VAR278	22.9934	46.7603	607
VAR282	8.9305	8.8265	607
VAR288	0.9143	0.2801	607
VAR289	0.2916	0.4549	607
VAR290	0.6656	0.4722	607
VAR291	0.3937	0.4890	607
VAR292	0.8715	0.3349	607
VAR293	0.4811	0.5001	607
VAR294	2.4530	0.9854	607
VAR295	0.2965	0.4571	607
VAR296	2.1565	0.6425	607
VAR297	0.5305	0.4995	607
VAR298	2.4316	0.6661	607
VAR299	0.4596	0.4988	607
VAR300	0.7364	0.4409	607
VAR301	1.9374	1.7347	607
VAR302	0.1911	0.3935	607
VAR303	0.1054	0.3074	607
VAR304	2.3245	0.8236	607
VAR305	2.1153	0.8899	607
VAR309	0.4712	0.4996	607

# APPENDIX B (continued)

	VAR013	VAR024	VAR025	VAR028	VAR029	VAR031	VAR040	VAR064	VAR073	VAR085	VAR087	VAR111
VAR013	1.00000	0.08228	0.07324	-0.21161	-0.23379	-0.26775	-0.05368	-0.00386	-0.25218	-0.06876	-0.00870	0.07179
VAR024	0.08228	1.00000	0.88628	-0.14557	-0.29943	-0.35152	-0.21084	-0.12388	-0.26945	-0.17514	-0.17213	-0.11467
VAR025	0.07324	0.88628	1.00000	-0.20911	-0.22430	-0.41418	-0.24456	-0.10948	-0.22818	-0.20268	-0.18638	-0.09857
VAR028	-0.21161	-0.14557	-0.20911	1.00000	0.16192	0.68506	0.36554	-0.04314	0.44771	0.18214	-0.05864	0.15964
VAR029	-0.23379	-0.29943	-0.22430	0.16192	1.00000	0.59503	0.19717	0.11737	0.01693	0.12120	0.00484	0.08882
VAR031	-0.26775	-0.35152	-0.41418	0.68506	0.59503	1.00000	0.43671	0.07115	0.70640	0.31452	0.04036	0.17280
VAR040	-0.05368	-0.21084	-0.24456	0.36554	0.19717	0.43671	1.00000	0.06425	0.30671	0.31157	0.06876	0.10270
VAR064	-0.00386	-0.12388	-0.10948	-0.04314	0.11737	0.07115	0.06425	1.00000	0.08141	0.02995	0.14026	0.09569
VAR073	-0.25218	-0.26945	-0.22818	0.44771	0.81693	0.70640	0.30671	0.08141	1.00000	0.19883	0.01256	0.09712
VAR085	-0.06876	-0.17514	-0.20268	0.18214	0.02995	0.14026	0.31157	0.02995	0.19883	1.00000	0.17746	0.07199
VAR087	-0.00870	-0.17213	-0.18638	-0.05864	0.00484	0.04036	0.06876	0.14026	0.01256	0.17746	1.00000	0.10505
VAR111	0.07179	0.11467	0.09857	0.15964	0.08882	0.17280	0.10270	0.09569	0.01256	0.07199	0.10505	1.00000
VAR127	0.09612	0.06343	0.06803	0.10295	0.00603	0.00630	0.04143	0.03567	0.07145	0.15260	0.02547	0.07134
VAR127	0.09399	0.13048	0.14300	0.14006	0.12050	0.22853	0.07611	0.09765	0.16497	0.26958	0.07616	0.16455
VAR147	0.12989	0.22999	0.25789	0.23708	0.23991	0.41934	0.23977	0.10483	0.26026	0.23327	0.11750	0.10672
VAR149	0.20990	0.16806	0.23746	0.98820	0.17671	0.70419	0.35307	0.03547	0.43389	0.19628	0.05678	0.16793
VAR150	0.21460	0.18283	0.24690	0.70431	0.19267	0.58867	0.28057	0.01617	0.35223	0.11667	0.02405	0.14744
VAR151	0.20879	0.37196	0.27816	0.16411	0.87803	0.55235	0.19165	0.10575	0.66195	0.10633	0.00274	0.08630
VAR152	0.16751	0.35466	0.22726	0.15989	0.53089	0.38986	0.17441	0.08113	0.41266	0.12436	0.01148	0.11567
VAR154	0.27055	0.37328	0.43874	0.60593	0.57422	0.89581	0.36176	0.08071	0.63433	0.29651	0.05571	0.15813
VAR155	0.23115	0.33854	0.39985	0.42461	0.41194	0.61499	0.24992	0.09310	0.25400	0.17079	0.04474	0.14160
VAR156	0.07199	0.22414	0.24633	0.37441	0.23806	0.47913	0.25070	0.02058	0.29926	0.15367	0.00251	0.05169
VAR162	0.13108	0.34166	0.33477	0.22836	0.29392	0.37571	0.13610	0.06527	0.31242	0.15604	0.04721	0.00427
VAR164	0.34654	0.23968	0.25345	0.21732	0.18067	0.32714	0.73453	0.07865	0.24769	0.29030	0.06225	0.13547
VAR165	0.01547	0.00153	0.04788	0.29693	0.19748	0.28206	0.03920	0.02645	0.21503	0.08923	0.08068	0.12922
VAR179	0.06930	0.29056	0.29368	0.00625	0.14653	0.19726	0.07947	0.05665	0.09842	0.09622	0.10918	0.03455
VAR185	0.09804	0.26247	0.34223	0.58895	0.50530	0.74629	0.59549	0.08729	0.60667	0.28466	0.05844	0.22558
VAR186	0.07954	0.28101	0.23802	0.25024	0.37262	0.40124	0.31131	0.07850	0.35551	0.14439	0.01231	0.18944
VAR187	0.21646	0.38326	0.32041	0.38392	0.76490	0.66899	0.21571	0.09508	0.74269	0.21074	0.02259	0.09023
VAR188	0.07077	0.25144	0.24886	0.21300	0.21222	0.30694	0.11330	0.01072	0.25381	0.11441	0.06357	0.02522
VAR191	0.00202	0.21608	0.25375	0.25480	0.17151	0.37313	0.02985	0.06429	0.25231	0.27159	0.06465	0.17930
VAR192	0.00310	0.02019	0.01873	0.27164	0.20626	0.29082	0.02686	0.03597	0.24506	0.09739	0.03498	0.10728
VAR193	0.10054	0.19644	0.19907	0.30680	0.39038	0.43156	0.03057	0.13514	0.39826	0.05767	0.05119	0.08508
VAR195	0.07492	0.10414	0.12300	0.16067	0.09708	0.17117	0.15034	0.04769	0.13719	0.08296	0.08605	0.05465
VAR196	0.05291	0.07951	0.05255	0.16846	0.03482	0.14727	0.04759	0.14493	0.07106	0.05514	0.08884	0.06395
VAR201	0.04679	0.16351	0.15298	0.07184	0.04343	0.02666	0.13631	0.38673	0.03317	0.13299	0.07743	0.01920
VAR202	0.03028	0.14996	0.14249	0.06102	0.04043	0.03840	0.13523	0.41441	0.02864	0.12224	0.05477	0.03811
VAR203	0.12783	0.26204	0.30365	0.19126	0.08600	0.23652	0.23320	0.05795	0.17024	0.17376	0.20090	0.05887
VAR208	0.02810	0.15046	0.15815	0.00714	0.01156	0.05408	0.08615	0.05787	0.03489	0.21768	0.14705	0.05571
VAR213	0.01075	0.12266	0.14878	0.08968	0.09548	0.14158	0.15194	0.09708	0.14089	0.09433	0.11986	0.09367
VAR220	0.11074	0.19972	0.22629	0.24064	0.14834	0.38311	0.33695	0.05049	0.23716	0.09180	0.12955	0.07233
VAR222	0.00698	0.18229	0.19857	0.04094	0.01763	0.07234	0.04708	0.12609	0.02557	0.18315	0.086495	0.08573
VAR251	0.11335	0.14421	0.14220	0.12087	0.15031	0.22194	0.14458	0.09678	0.15320	0.10785	0.08742	0.09782
VAR276	0.03734	0.11363	0.11479	0.09895	0.02427	0.05569	0.03165	0.02116	0.03009	0.09410	0.11442	0.09402
VAR278	0.00241	0.04426	0.02644	0.02473	0.08868	0.06103	0.07174	0.02295	0.07143	0.00544	0.07212	0.01562
VAR282	0.22316	0.65707	0.57922	0.32210	0.58956	0.53139	0.26425	0.09451	0.56874	0.20448	0.09131	0.12821
VAR288	0.04589	0.10418	0.12565	0.22705	0.12247	0.27803	0.20965	0.02283	0.15621	0.12636	0.04925	0.15593
VAR289	0.72758	0.15671	0.12206	0.11232	0.27829	0.23347	0.06112	0.08437	0.24429	0.02636	0.00455	0.02140
VAR290	0.05103	0.03226	0.05139	0.20189	0.15232	0.19582	0.11246	0.07450	0.19961	0.07122	0.03681	0.03494
VAR291	0.03063	0.03633	0.00219	0.16189	0.15688	0.22800	0.39356	0.04532	0.17704	0.19595	0.04887	0.13336
VAR292	-0.11327	-0.21708	-0.24553	0.13727	0.13858	0.19636	0.16969	0.01305	0.16043	0.06383	0.11202	0.02877
VAR293	0.15872	0.61523	0.54284	0.06607	0.22898	0.24472	0.23059	0.13007	0.17752	0.12233	0.13228	0.08375
VAR294	0.14730	0.76605	0.69003	0.07226	0.27022	0.30654	0.24757	0.14388	0.20721	0.15933	0.16803	0.10244
VAR295	0.08034	0.76690	0.67814	0.08019	0.23478	0.26117	0.15223	0.08667	0.20502	0.13299	0.15721	0.11620
VAR296	0.09898	0.79261	0.71130	0.08946	0.28527	0.34941	0.21666	0.11554	0.22830	0.16424	0.18642	0.11298
VAR297	0.09754	0.61823	0.70400	0.12523	0.16893	0.35162	0.21037	0.08521	0.14991	0.12412	0.18237	0.13048
VAR298	0.10848	0.63592	0.71595	0.14439	0.20383	0.41676	0.25946	0.09996	0.18036	0.15581	0.17235	0.12081
VAR299	0.18686	0.21237	0.26396	0.38442	0.31050	0.49591	0.28797	0.06364	0.35401	0.09684	0.04348	0.07830
VAR300	0.06212	0.19240	0.22568	0.32614	0.16249	0.43013	0.21451	0.00775	0.22390	0.13547	0.00125	0.09550
VAR301	0.10442	0.35424	0.39918	0.21515	0.10117	0.25412	0.22572	0.05934	0.18895	0.15883	0.15727	0.07827
VAR302	0.14876	0.27747	0.28693	0.04466	0.02603	0.11366	0.05541	0.06883	0.03580	0.09535	0.09588	0.05693
VAR303	0.23418	0.34933	0.24695	0.25787	0.38778	0.36805	0.18308	0.06349	0.36788	0.15646	0.00893	0.11710
VAR304	0.13412	0.33651	0.34428	0.40311	0.20837	0.33382	0.04688	0.09055	0.28379	0.00863	0.20655	0.07163
VAR305	0.15946	0.36909	0.37564	0.43604	0.16162	0.32562	0.05817	0.11100	0.27307	0.00681	0.17175	0.08667
VAR309	0.15485	0.44408	0.40541	0.33232	0.07821	0.06079	0.28200	0.06933	0.04231	0.18795	0.08032	0.12264



# APPENDIX B (continued)

	VAR119	VAR127	VAR147	VAR149	VAR150	VAR151	VAR152	VAR154	VAR155	VAR156	VAR162	VAR164
VARU13	0.09612	-0.03939	0.12989	-0.20990	0.21400	-0.20879	0.15751	-0.27055	0.23115	0.07199	-0.13108	-0.09654
VARU24	0.06303	0.06303	0.22999	-0.10806	0.18283	-0.37196	0.35466	-0.37328	0.33854	0.22414	-0.34166	-0.23960
VARU25	0.06003	-0.14340	0.25789	-0.23746	0.24696	-0.27816	0.22726	-0.43074	0.39905	0.24633	-0.33477	-0.25345
VARU28	-0.10295	0.14006	-0.23708	0.94820	-0.70431	0.16411	-0.16989	0.60593	-0.42461	-0.37441	0.22036	0.21732
VARU29	0.00003	0.12030	-0.23991	0.17671	-0.19267	0.87803	0.53089	0.57422	-0.41194	-0.23806	0.29392	0.18067
VARU31	-0.04636	0.22653	-0.41934	0.70419	-0.58807	0.55235	-0.38996	0.69581	-0.61499	-0.47913	0.37571	0.32714
VARU40	0.04143	0.07011	-0.23977	0.35307	-0.28057	0.19165	-0.17441	0.38176	-0.24992	-0.25070	0.13610	0.73453
VARU64	0.03507	0.07657	-0.10883	-0.05567	0.01617	0.10575	-0.08113	0.08071	-0.09310	-0.02058	0.06527	0.07865
VARU73	0.07139	0.16497	-0.26026	0.43389	-0.35223	0.60195	-0.41266	0.63433	-0.42540	-0.29926	0.31242	0.24769
VARU85	-0.15260	0.26956	-0.23327	0.19628	-0.11667	0.10633	-0.12436	0.29651	-0.17079	-0.15367	0.15604	0.29030
VARU87	0.02547	0.07016	-0.11750	-0.05678	0.02405	0.00274	-0.01148	0.05571	-0.04474	0.00251	0.04721	0.06227
VAR111	-0.07134	0.16455	-0.10672	0.16793	-0.18744	0.08630	-0.11567	0.15813	-0.10166	-0.05169	-0.00427	0.13547
VAR119	1.00000	0.17157	0.03230	-0.09731	0.07209	-0.00858	0.03773	-0.04334	0.05765	0.04651	-0.01576	0.10255
VAR127	0.17157	1.00000	-0.19883	0.15915	-0.15024	0.10339	-0.12371	0.23566	-0.11161	-0.18774	0.06337	0.77400
VAR147	0.07230	-0.19883	1.00000	-0.26355	0.33484	-0.25167	0.26628	-0.49069	0.60487	0.20104	-0.20751	-0.22065
VAR149	-0.09731	0.15915	-0.26355	1.00000	-0.80612	0.19549	-0.20767	0.60627	-0.44236	0.41464	0.25102	-0.25909
VAR150	0.07209	-0.15024	0.33484	-0.80612	1.00000	-0.23336	0.24087	-0.64178	0.60627	0.30855	-0.23093	-0.23000
VAR151	-0.00858	0.10339	-0.25167	0.19549	-0.23336	1.00000	-0.71086	0.58912	-0.44184	-0.29021	0.28758	0.18641
VAR152	0.03773	-0.12371	0.26628	-0.20767	0.24087	-0.71086	1.00000	-0.46246	0.47693	0.29853	-0.24346	-0.19973
VAR154	-0.04334	0.23566	-0.49069	0.60627	-0.64178	0.58912	-0.46246	1.00000	-0.77655	-0.44179	0.37031	-0.35120
VAR155	0.05765	-0.17141	0.04487	-0.48236	0.60287	-0.48184	0.47693	-0.77055	1.00000	0.29853	-0.24346	-0.24386
VAR156	0.04651	-0.18774	0.20104	-0.41464	0.38385	-0.29821	0.26905	-0.44179	0.29853	1.00000	-0.22336	-0.18779
VAR162	-0.01576	0.06337	-0.20751	0.25102	-0.23093	0.28758	-0.24046	0.37031	-0.24346	-0.22336	1.00000	0.11650
VAR164	0.10255	-0.10255	0.25909	-0.25909	-0.23005	0.18041	-0.19473	0.35120	-0.24386	-0.18779	0.11650	1.00000
VAR165	-0.04774	0.04774	-0.13274	0.33165	-0.27921	0.23753	-0.20175	0.29760	-0.23396	-0.21721	0.00343	0.06780
VAR179	0.03160	0.05148	-0.13925	0.01346	-0.04231	0.20428	-0.13709	0.20538	-0.12790	-0.16376	0.12404	0.10839
VAR185	-0.05011	0.36956	-0.35871	0.60665	-0.46322	0.49605	-0.38384	0.67540	-0.45689	-0.42148	0.42536	0.45677
VAR186	-0.04922	-0.33430	0.26977	-0.28451	0.29229	-0.43602	0.46311	-0.45002	0.36653	-0.25479	-0.42342	-0.42342
VAR187	-0.05626	0.14373	0.28316	0.41556	-0.36781	0.74371	-0.53565	0.66271	-0.50398	0.31496	0.44494	0.29330
VAR188	-0.08393	0.03468	-0.18436	0.24256	-0.16683	0.22224	-0.16686	0.29498	-0.18733	-0.19410	0.59231	0.09610
VAR191	0.05083	-0.59077	-0.24110	0.28944	-0.27557	0.16919	-0.18246	0.33411	-0.24671	-0.23094	0.14273	0.61486
VAR192	-0.06223	-0.17700	0.11030	0.26967	-0.20917	0.21022	-0.14421	0.27356	-0.17478	-0.19144	-0.07116	0.01830
VAR193	-0.05512	0.00881	-0.25448	0.31488	-0.23136	0.36547	-0.23464	0.36516	-0.24433	-0.16053	0.17238	0.03319
VAR195	0.01362	-0.18829	0.20320	-0.17878	0.20890	-0.09519	0.12793	-0.24547	0.17286	0.10907	-0.06323	-0.19197
VAR196	-0.07078	0.08577	0.04255	-0.18562	0.19697	-0.06295	0.06315	-0.15048	0.16525	0.08447	-0.06876	0.00575
VAR201	-0.01624	0.14362	0.07173	0.05528	0.01603	-0.07462	0.08761	-0.04628	0.07234	0.04593	0.02220	0.16447
VAR202	0.00322	0.14728	0.08193	0.03880	0.02431	-0.06889	0.08009	-0.06017	0.08221	0.04236	0.01082	0.17075
VAR203	0.07944	-0.19042	0.26022	-0.18964	0.15760	-0.06332	0.05314	-0.25164	0.19432	0.06965	-0.09049	-0.23201
VAR208	0.08417	-0.11733	0.04184	0.03595	0.07152	-0.01146	0.09487	-0.08039	0.07610	0.07370	-0.07616	-0.16136
VAR213	0.01101	-0.19671	0.15609	-0.09586	0.09800	-0.08542	0.12195	-0.16185	0.15483	-0.07388	-0.02557	-0.19868
VAR220	0.08677	-0.28670	0.24833	-0.26640	0.19188	-0.14985	0.15679	-0.36406	0.21302	0.20215	-0.19686	-0.31860
VAR222	-0.03755	-0.03808	0.13509	0.03497	-0.00799	-0.02406	0.04591	-0.04500	0.06447	0.04222	-0.10748	-0.03930
VAR251	-0.07427	-0.17503	0.19966	-0.14101	0.15414	-0.12816	0.11041	-0.22118	0.19654	0.13836	-0.10458	-0.16457
VAR276	-0.16134	-0.15370	-0.04178	0.12819	-0.11444	-0.00757	-0.08752	0.10013	-0.09449	-0.14538	0.05911	-0.03092
VAR278	-0.01811	-0.16462	0.02325	-0.01134	-0.02317	-0.07041	-0.01785	0.04145	0.02115	0.07413	-0.01333	-0.05425
VAR282	0.10257	-0.19166	0.39984	-0.35435	0.39053	-0.67954	0.67618	-0.66466	0.59669	0.30503	-0.31955	-0.27814
VAR288	0.13123	-0.13768	0.08548	-0.24265	0.21624	-0.12724	0.11253	-0.23310	0.14555	0.35125	-0.10335	-0.09721
VAR289	0.08477	-0.05720	0.19239	-0.12052	0.16844	-0.28445	0.25702	-0.25643	0.28036	0.09074	-0.10972	-0.05286
VAR290	0.01732	-0.12357	0.06051	-0.21770	0.21680	-0.14716	0.14968	-0.26370	0.17249	0.15072	-0.01156	-0.15240
VAR291	-0.11576	-0.22117	0.22692	-0.17950	0.13636	-0.18066	0.16764	-0.22792	0.15637	0.16447	-0.15269	-0.46815
VAR292	0.10254	-0.21594	-0.17402	0.14038	-0.14312	0.14171	-0.12817	-0.21000	-0.20812	-0.13584	0.08619	0.18429
VAR293	0.04963	-0.13617	0.21059	-0.08584	0.14789	-0.29637	0.27116	-0.25518	0.25618	0.19995	-0.26293	-0.25809
VAR294	0.02004	-0.15814	0.22737	-0.09886	0.15538	-0.33347	0.28605	-0.31678	0.29060	0.22195	-0.32134	-0.27829
VAR295	0.04933	-0.10347	0.19580	-0.09223	0.11409	-0.26753	0.26949	-0.26343	0.24761	0.17255	-0.30179	-0.19390
VAR296	0.01329	-0.11827	0.21457	-0.11792	0.14171	-0.33262	0.28711	-0.33541	0.28152	0.22283	-0.37144	-0.24176
VAR297	0.03198	-0.11551	0.21754	-0.15837	0.19413	-0.22503	0.19934	-0.36073	0.32378	0.21317	-0.28220	-0.23185
VAR298	0.01648	-0.12627	0.21260	-0.18758	0.22033	-0.26988	0.21249	-0.40500	0.32673	0.24530	-0.34196	-0.26411
VAR299	0.02459	-0.21293	0.35369	-0.46534	0.66557	-0.32293	0.29195	-0.50608	0.61294	0.28982	-0.26221	-0.25724
VAR300	0.03553	-0.14010	0.18437	-0.37853	0.33618	-0.20058	0.20197	-0.38117	0.25093	0.68654	-0.18662	-0.18825
VAR301	0.10963	-0.18300	0.31002	-0.21533	0.18245	-0.09133	0.07385	-0.27492	0.21758	0.09901	-0.11125	-0.22434
VAR302	0.01556	-0.03866	0.13370	-0.06223	0.04809	-0.02954	0.08919	-0.08640	0.04800	0.05980	-0.12059	-0.05666
VAR303	0.10263	-0.15144	0.34583	-0.29294	0.36613	-0.51891	0.17955	-0.45830	0.58227	0.24503	-0.22561	-0.21582
VAR304	-0.06747	-0.06627	0.05278	-0.43090	-0.39784	0.21169	0.36886	-0.32548	0.25098	0.10984	-0.02735	-0.02938
VAR305	-0.09026	-0.07166	0.09420	-0.45589	-0.38525	0.15681	-0.11860	0.29935	-0.21003	-0.17501	-0.01031	-0.02697
VAR306	0.07592	-0.18893	0.34839	-0.34186	0.31874	-0.69174	0.44405	-0.62476	0.44441	0.30283	-0.35538	-0.25550

# APPENDIX B (continued)

	VAR165	VAR179	VAR185	VAR186	VAR187	VAR188	VAR191	VAR192	VAR193	VAR195	VAR196	VAR201
VAR013	-0.01547	-0.06930	-0.09804	0.07954	-0.21648	-0.0777	-0.00202	-0.00310	-0.10054	0.07492	0.05291	-0.04679
VAR024	-0.06153	-0.29456	-0.32647	0.28101	-0.38326	-0.25144	-0.21606	-0.02019	-0.19644	0.10414	-0.07951	0.16351
VAR025	-0.04788	-0.29368	-0.34223	0.23002	-0.32041	-0.24806	-0.25375	-0.01073	-0.19907	0.12300	-0.05255	0.15298
VAR028	-0.29493	0.00625	0.58895	-0.25024	0.38392	0.21300	0.26480	0.27164	0.30680	-0.16067	-0.16846	0.07184
VAR029	0.19748	0.14653	0.50530	-0.37262	0.76490	0.21222	0.17151	0.20626	0.39038	-0.09708	-0.03482	-0.04343
VAR031	0.28206	0.19726	0.74629	-0.40124	0.66899	0.30694	0.37313	0.29082	0.43156	-0.17177	-0.14727	-0.02666
VAR040	-0.03920	0.07947	0.59549	-0.31131	0.21571	0.11330	0.82985	0.02086	0.03057	-0.15034	-0.04759	0.13631
VAR064	-0.02645	0.05565	0.08729	-0.07050	0.09508	0.01672	0.06429	-0.03597	0.13514	-0.04769	0.14493	-0.38673
VAR073	0.21503	0.09842	0.60667	-0.35550	0.74269	0.25381	0.25231	0.24506	0.39826	-0.13719	-0.07106	0.03317
VAR085	0.08923	0.09622	0.28446	-0.14439	0.21074	0.11241	0.27159	0.09739	0.05767	-0.08296	-0.05614	0.13299
VAR087	-0.04068	0.10918	0.05844	0.01231	0.02259	0.06357	0.06465	-0.03498	0.05119	-0.08605	0.08884	-0.07743
VAR111	0.12922	-0.03455	0.22258	-0.18944	0.09023	-0.02522	0.17930	0.10728	0.08508	-0.05465	-0.06395	-0.01920
VAR119	-0.04774	0.03160	-0.05011	-0.04822	-0.05826	-0.08393	0.05083	-0.06223	-0.05512	0.01342	0.07078	-0.01624
VAR127	-0.00493	0.05148	0.36956	-0.33430	0.14373	0.03448	0.59077	-0.01700	-0.00881	-0.18828	0.00577	0.14302
VAR147	-0.13274	-0.13925	-0.35871	0.26977	-0.28316	-0.18436	-0.24110	-0.11030	-0.25448	0.20320	0.04255	0.07173
VAR149	-0.33165	0.01346	0.60665	-0.28451	0.41656	0.24256	0.28944	0.26967	0.31488	-0.17878	-0.18562	0.05528
VAR150	-0.27921	-0.04231	-0.46322	0.29229	-0.36781	-0.16683	-0.27557	-0.20917	-0.23136	0.20890	0.19697	0.01603
VAR151	-0.23753	0.20428	0.49625	-0.43602	0.74371	0.22224	0.16919	0.21022	0.36567	-0.09519	-0.06295	-0.07462
VAR152	-0.20175	-0.13709	0.38384	0.46311	-0.53565	-0.16646	-0.18246	-0.14421	-0.23444	0.12793	0.06315	0.08761
VAR154	-0.28760	0.20538	0.67540	-0.45002	0.66271	0.29498	-0.33411	0.27308	0.38516	-0.20547	-0.15688	-0.04628
VAR155	-0.23396	0.12290	0.45899	0.38653	-0.50398	-0.18733	-0.24671	-0.17478	-0.26433	0.17286	0.16525	0.07234
VAR156	-0.21721	-0.16370	-0.42148	0.25479	-0.31490	-0.19410	-0.23094	-0.19144	-0.16053	0.10907	0.08442	0.04593
VAR162	-0.06343	0.12404	0.42536	-0.35698	0.44494	0.59231	0.14273	-0.07116	0.17238	-0.06323	-0.06876	-0.02220
VAR164	0.06788	0.10839	0.45677	-0.42382	0.29336	0.09616	0.14488	0.01830	0.03319	-0.19197	0.00575	0.16447
VAR165	1.00000	-0.01752	0.44290	-0.33695	0.33771	0.01087	0.04759	0.59773	0.15835	-0.11685	0.08730	0.05262
VAR179	-0.01752	1.00000	0.10269	-0.13651	0.20968	0.16663	0.09528	0.01216	-0.02510	0.01496	-0.02769	-0.07707
VAR185	-0.48290	0.10269	1.00000	-0.57668	0.57390	0.40388	0.52203	0.40353	0.52491	-0.18223	0.10117	0.05276
VAR186	-0.33695	-0.13651	0.57668	1.00000	-0.47545	-0.21144	-0.26060	-0.20141	-0.25927	0.17898	0.04921	-0.00922
VAR187	-0.33771	0.20968	0.57390	-0.47545	1.00000	0.28880	0.17883	0.19377	0.40271	-0.12364	-0.09782	-0.03107
VAR188	0.01087	0.10663	0.40388	-0.21144	0.28880	1.00000	0.08621	-0.06208	0.13508	-0.06137	0.02180	-0.00207
VAR191	0.04759	0.09528	0.52203	-0.26060	0.17883	0.08621	1.00000	0.03379	0.03353	-0.10996	-0.04375	0.10297
VAR192	-0.59773	0.12126	0.40353	-0.20141	0.19377	-0.06208	0.03379	1.00000	0.09626	-0.07775	-0.08460	0.08235
VAR193	0.15835	0.02510	0.52491	-0.25927	0.40271	0.13508	0.03353	0.09626	1.00000	-0.07940	-0.01931	-0.12441
VAR195	-0.11685	0.01496	0.18223	0.17898	-0.12364	-0.06137	-0.10996	-0.07775	-0.07940	1.00000	-0.24477	-0.02318
VAR196	-0.08730	0.08730	-0.10117	0.04921	-0.09782	0.02140	-0.04375	-0.08460	-0.01931	-0.24477	1.00000	-0.14442
VAR201	0.05262	-0.07707	0.05276	-0.00922	-0.03107	-0.00207	0.10297	0.08235	0.12441	-0.02318	-0.14442	1.00000
VAR202	0.01304	0.07039	0.03768	0.01251	-0.03018	0.00384	0.10200	0.06025	-0.13208	0.02191	0.09315	0.93321
VAR203	-0.13837	-0.09218	-0.27522	0.14327	-0.13631	-0.09440	-0.22346	-0.12585	-0.09646	0.16350	-0.05218	0.01929
VAR208	0.03425	0.03904	-0.03569	0.14114	-0.11415	-0.08087	-0.07383	0.07472	0.01231	0.09054	-0.01723	0.09192
VAR213	-0.01549	-0.00417	-0.12702	0.10422	-0.10097	-0.05309	-0.12331	-0.06094	-0.03135	0.62853	-0.19976	-0.00392
VAR220	-0.11048	0.09980	-0.32283	0.17548	-0.24802	-0.16292	-0.28489	-0.10009	-0.07103	0.07513	0.07333	-0.11398
VAR222	-0.06556	0.10974	-0.07575	0.00440	-0.04915	-0.06405	-0.07341	-0.00332	-0.03824	0.06402	0.08835	0.06079
VAR251	-0.04864	0.10323	-0.21677	0.12623	-0.14327	0.09222	-0.07859	-0.07916	-0.09086	0.10302	0.09665	0.08673
VAR276	-0.00131	0.02487	0.03023	0.00250	0.09530	0.04340	0.01462	0.02704	-0.08029	0.04258	-0.06112	-0.04449
VAR278	-0.07128	0.00971	-0.08877	0.03430	-0.01419	-0.02872	-0.02063	-0.06176	-0.09698	0.08026	-0.01355	-0.02047
VAR282	-0.23689	-0.17192	-0.49225	0.44167	-0.63383	-0.22742	-0.24567	-0.18855	-0.29163	0.21860	0.02908	0.11627
VAR288	-0.12217	-0.01937	-0.25501	0.08608	-0.13033	-0.09958	-0.16787	-0.15917	-0.03744	0.09444	0.06483	0.07191
VAR289	-0.01410	0.08055	-0.13708	0.15706	-0.22936	-0.08657	-0.02585	-0.01792	-0.17706	0.06682	-0.02132	-0.01200
VAR290	-0.24783	0.02656	-0.19772	0.17811	-0.18926	-0.01092	-0.06832	-0.18835	-0.07145	0.37560	0.06885	-0.05503
VAR291	-0.38103	-0.07371	-0.50582	0.55052	-0.21930	-0.15642	-0.35593	-0.23424	-0.17700	0.19925	0.01294	-0.17074
VAR292	-0.01354	0.05779	0.13539	-0.07907	-0.09976	0.04467	-0.14459	0.00408	0.02060	-0.10928	0.05399	-0.03374
VAR293	-0.04376	-0.28213	-0.29181	0.31667	-0.26603	-0.20562	-0.23928	-0.01447	-0.12909	0.06377	-0.08914	0.11977
VAR294	-0.04024	-0.34566	-0.32561	0.31999	-0.32771	-0.28552	-0.24862	0.01858	-0.17233	0.09131	-0.10282	0.14855
VAR295	-0.00531	-0.19026	-0.22971	0.20375	-0.29904	-0.19351	-0.16578	0.01361	-0.16362	0.06026	-0.06588	0.10565
VAR296	-0.01867	-0.37576	-0.30707	0.24515	-0.36768	-0.28282	-0.22506	0.02640	-0.17992	0.04967	-0.03958	0.12458
VAR297	-0.01455	-0.29924	-0.29776	0.21929	-0.24825	-0.19926	-0.22377	0.00548	-0.16243	0.06794	-0.01223	0.07579
VAR298	-0.02773	-0.10175	-0.34523	0.23513	-0.29923	-0.27938	-0.28381	-0.00344	-0.15230	0.06197	0.01964	0.08505
VAR299	-0.19651	-0.03752	-0.43204	0.33360	-0.37066	-0.16970	-0.28401	-0.16389	-0.21510	0.18042	0.10328	0.02703
VAR300	-0.15767	-0.10181	-0.34579	0.19011	-0.25632	-0.19280	-0.17282	-0.16485	-0.08250	0.05884	0.05724	0.06184
VAR301	-0.14683	-0.10565	-0.29909	0.17012	-0.17851	-0.18458	-0.19933	-0.14328	-0.13842	0.19228	-0.04797	0.05147
VAR302	-0.02208	-0.11136	-0.07383	0.03635	-0.05107	-0.09119	-0.07824	0.02120	-0.08694	0.03047	-0.05552	0.03118
VAR303	-0.20033	-0.10060	-0.34632	0.44058	-0.47694	-0.14063	-0.17307	-0.13376	-0.17219	0.16229	0.12204	0.09371
VAR304	-0.24019	-0.14524	-0.22255	-0.13026	-0.27651	-0.01579	-0.00040	0.21919	0.12192	0.04165	-0.26224	0.07635
VAR305	-0.21922	-0.14099	-0.22633	-0.09429	-0.23138	-0.02098	-0.00085	0.21785	0.12451	0.03251	-0.24034	0.11666
VAR309	-0.22388	-0.22768	-0.50054	-0.39393	-0.66256	-0.36132	-0.26236	-0.22141	-0.37458	0.08286	0.05664	0.07089

# APPENDIX B (continued)

	VAR202	VAR203	VAR204	VAR213	VAR220	VAR222	VAR251	VAR276	VAR278	VAR282	VAR288	VAR289
VAR013	-0.03028	0.12743	0.02810	-0.01075	0.11074	-0.00696	0.11335	-0.03734	-0.00241	0.22316	0.04589	0.72750
VAR024	0.14996	0.46204	0.15046	0.12266	0.19972	0.18229	0.14421	-0.11363	-0.04426	0.85707	0.10410	0.15671
VAR025	0.14249	0.30365	0.15815	0.14874	0.22629	0.19857	0.14220	-0.11474	-0.02444	0.37922	0.12565	0.12260
VAR028	0.06102	-0.19126	-0.00714	-0.08968	-0.24064	0.04094	-0.12087	0.03895	-0.02473	-0.32210	-0.22705	-0.11234
VAR029	-0.08043	-0.08800	-0.01156	-0.09548	-0.14834	-0.01763	-0.15031	-0.02427	-0.08808	-0.56956	-0.12247	-0.27829
VAR031	-0.03840	-0.23652	-0.05408	-0.14158	-0.38311	-0.07234	-0.22194	0.08569	-0.06103	-0.53139	-0.27803	-0.23347
VAR040	0.13523	-0.23320	-0.08615	-0.15194	-0.33695	-0.04708	-0.14458	0.03165	-0.01714	-0.28425	-0.20985	-0.08112
VAR064	-0.41841	-0.05795	-0.05787	-0.09708	-0.05049	-0.12609	-0.05678	-0.02116	-0.02295	-0.09451	-0.02283	-0.08437
VAR073	0.07804	-0.17074	-0.03489	-0.14089	-0.23716	-0.02557	-0.15320	0.03009	-0.07143	-0.56874	-0.15621	-0.24429
VAR085	0.12224	-0.17376	-0.21768	-0.09433	-0.19110	-0.18315	-0.10785	0.09410	-0.08544	-0.28448	-0.12636	-0.02630
VAR087	-0.05477	-0.20090	-0.14705	-0.11986	-0.12955	-0.08605	-0.08782	0.11442	0.07212	-0.09131	-0.04925	-0.00455
VAR111	-0.03811	-0.05887	-0.05571	-0.09367	-0.07235	-0.08573	-0.09782	0.09402	0.01562	-0.12821	-0.15593	-0.02140
VAR119	-0.03222	-0.07944	-0.08417	-0.01101	-0.08877	-0.03765	-0.07427	-0.16134	-0.01811	0.10257	-0.13123	-0.08477
VAR127	0.14720	-0.17042	-0.11733	-0.19671	-0.28647	-0.03868	-0.17503	-0.15370	-0.16462	-0.19146	-0.13768	-0.05720
VAR147	0.09193	-0.26022	-0.08184	-0.15609	-0.28833	0.13589	-0.19966	-0.04178	0.02325	0.39984	0.08548	0.19239
VAR149	-0.03840	-0.18966	-0.03595	-0.09586	-0.26640	0.03497	-0.14101	0.12819	-0.01138	-0.35435	-0.24265	-0.12052
VAR150	0.02431	-0.15740	-0.07152	-0.09800	-0.19188	0.00789	-0.15414	-0.11444	0.02317	0.39053	-0.16424	-0.16844
VAR151	-0.08809	-0.06332	-0.01146	-0.06542	-0.14985	-0.02406	-0.12810	-0.00757	-0.07081	-0.67958	-0.12724	-0.28485
VAR152	-0.08009	-0.05314	-0.09467	-0.12195	-0.15679	-0.04591	-0.11041	-0.08752	-0.01785	-0.67618	-0.11253	-0.25702
VAR154	-0.08017	-0.25140	-0.08839	-0.16185	-0.36406	-0.08500	-0.22110	0.10013	-0.04145	-0.60466	-0.23310	-0.25643
VAR155	0.08221	-0.19432	-0.07610	-0.15883	-0.21302	0.06447	-0.19654	-0.09449	0.02115	-0.59669	-0.14555	-0.28036
VAR156	-0.04236	-0.08965	-0.07370	-0.07388	-0.20215	-0.04296	-0.13636	-0.14538	-0.07413	0.30503	-0.35125	-0.09074
VAR162	-0.01882	-0.09089	-0.07616	-0.02557	-0.19686	-0.10748	-0.10458	-0.05911	-0.01333	-0.31955	-0.10335	-0.10972
VAR164	-0.17075	-0.23201	-0.16132	-0.19868	-0.31860	-0.03935	-0.16457	-0.03092	-0.05425	-0.27814	-0.09721	-0.05280
VAR165	0.01304	-0.13837	-0.03425	-0.01549	-0.11048	-0.06556	-0.08464	-0.00131	-0.07128	-0.23689	-0.12217	-0.01410
VAR179	-0.07039	-0.09218	-0.03904	-0.00417	-0.09980	-0.10974	-0.10323	-0.02487	-0.00971	-0.17192	-0.01937	-0.08055
VAR185	-0.03768	-0.25722	-0.03569	-0.12702	-0.32283	-0.07575	-0.21677	0.03023	-0.08677	-0.49225	-0.25501	-0.13708
VAR186	-0.01251	-0.14327	-0.14114	-0.10422	-0.17548	-0.00440	-0.12623	0.02520	0.03430	0.44187	0.08040	-0.15706
VAR187	-0.03018	-0.13631	-0.11415	-0.10097	-0.24802	-0.04915	-0.14327	-0.09530	-0.01419	-0.63383	-0.13033	-0.22936
VAR188	0.00304	-0.09440	-0.08087	-0.05309	-0.16292	-0.06445	-0.09222	-0.04340	-0.07672	-0.22782	-0.05958	-0.06557
VAR191	-0.02300	-0.22348	-0.07383	-0.12331	-0.28489	-0.07341	-0.07859	-0.01462	-0.02063	-0.24567	-0.16787	-0.02585
VAR192	-0.06025	-0.12583	-0.07472	-0.08094	-0.10009	-0.00332	-0.07916	-0.02704	-0.06176	-0.16655	-0.15917	-0.01792
VAR193	-0.13208	-0.09646	-0.01231	-0.03135	-0.07103	-0.03824	-0.09086	-0.06029	-0.09496	-0.29163	-0.03744	-0.17700
VAR195	-0.02191	-0.16350	-0.09054	-0.02853	-0.07513	-0.06442	-0.10302	-0.04258	-0.08026	0.21860	-0.09444	-0.06682
VAR196	-0.09315	-0.05216	-0.01723	-0.19976	-0.07333	-0.08835	-0.09665	-0.08112	-0.01355	-0.02908	-0.06883	-0.02132
VAR201	-0.93321	-0.09192	-0.09192	-0.00395	-0.11398	-0.06079	-0.06673	-0.04449	-0.02047	-0.11627	-0.07191	-0.01200
VAR202	1.00000	0.01526	0.09049	-0.00988	-0.10476	0.04823	0.08818	-0.01441	-0.11067	0.09345	0.01252	0.06331
VAR203	0.01526	1.00000	0.13834	0.11908	0.19774	0.18278	0.10148	-0.01391	-0.04154	0.24428	0.05092	0.06331
VAR208	0.09049	0.13834	1.00000	0.07602	0.20265	0.14111	0.07522	-0.04318	-0.02377	0.13976	0.01429	0.04909
VAR213	-0.09049	0.11908	0.07602	1.00000	0.07764	0.11058	0.08197	-0.04365	-0.02216	0.18520	0.05936	0.01849
VAR220	-0.10476	0.19774	0.20265	0.07764	1.00000	0.12886	0.09592	-0.10600	-0.07707	0.22887	0.15844	0.06364
VAR222	0.08823	0.18278	0.14111	0.11058	0.12886	1.00000	0.08120	-0.10849	-0.04434	0.10934	-0.02966	0.02421
VAR251	0.08818	0.10148	0.07522	0.08197	0.09592	0.08120	1.00000	0.06053	0.10197	0.18769	0.17104	0.18411
VAR276	-0.04678	0.01391	-0.04318	-0.04365	-0.10690	-0.10849	0.06053	1.00000	0.83451	-0.08167	-0.23548	-0.05173
VAR278	-0.01441	0.04154	-0.02377	0.02216	-0.02707	-0.06434	0.10197	0.83451	1.00000	0.00922	0.08198	-0.00194
VAR282	0.11067	0.24428	0.13976	0.18520	0.22887	0.10934	-0.02966	-0.08167	-0.00922	1.00000	0.11920	0.25256
VAR288	0.09345	0.05092	0.01429	0.05936	0.15844	-0.02966	0.17104	-0.23548	0.08198	0.11920	1.00000	0.02802
VAR289	-0.01252	0.06331	0.04909	0.01849	0.06364	0.02421	-0.14911	-0.05173	-0.00193	0.25256	0.02802	1.00000
VAR290	-0.03555	-0.09855	0.03026	0.25089	0.06899	-0.04416	-0.11538	-0.01707	0.05364	0.10927	0.11990	0.01686
VAR291	-0.15841	-0.14173	-0.05022	0.10532	0.21377	-0.06481	-0.11534	0.24671	0.21035	0.13023	0.02981	-0.00513
VAR292	-0.03272	-0.10937	-0.04607	-0.13554	-0.09172	-0.09984	-0.11432	0.01635	-0.02671	-0.28230	-0.08236	-0.10025
VAR293	0.11466	0.21319	0.15034	0.06802	0.15504	0.10671	-0.12104	-0.07147	-0.04341	0.36647	0.05908	0.24560
VAR294	0.13911	0.28523	0.17191	0.08608	0.19480	0.16831	-0.16177	-0.06293	-0.02450	0.44230	0.07508	0.21651
VAR295	0.10040	0.24183	0.11729	0.05671	0.14115	0.17961	0.10261	-0.06169	-0.02585	0.43518	0.06986	0.16279
VAR296	0.11877	0.23961	0.11348	0.05414	0.19191	0.19523	0.17511	-0.07459	-0.02293	0.42937	0.08380	0.17673
VAR297	0.07052	0.27023	0.11009	0.05663	0.15464	0.17975	0.13552	-0.10804	-0.05362	0.35255	0.07767	0.16055
VAR298	0.08576	0.24585	0.09862	0.05966	0.19139	0.16744	0.16279	-0.10907	-0.04192	0.34877	0.11006	0.15576
VAR299	0.04416	0.16604	0.06844	0.10674	0.13410	0.08193	0.19268	-0.04846	0.03239	0.41564	0.17600	0.18652
VAR300	0.07623	0.10299	0.10215	0.07535	0.19125	0.00350	0.18401	-0.21404	0.84361	0.22975	0.43146	0.06299
VAR301	0.04245	0.03719	0.11626	0.13238	0.17538	0.14932	0.13915	0.00469	0.04461	0.31742	0.08403	0.05664
VAR302	0.03923	0.15143	0.09656	0.01181	0.09398	0.11007	0.10370	-0.02433	0.01119	0.14466	0.01403	0.16750
VAR303	0.04698	0.12212	0.12592	0.12152	-0.17042	0.02758	0.13503	-0.09516	-0.00030	0.79464	0.10509	0.25184
VAR304	0.04472	0.23217	0.04280	0.08691	-0.04551	0.18854	-0.06579	0.09032	0.03834	0.02390	-0.21548	-0.07243
VAR305	0.07858	0.18491	0.09157	0.04520	-0.02401	0.16078	0.02414	-0.17036	0.03583	0.05798	-0.19200	-0.07913
VAR309	0.05809	-0.22460	-0.08464	0.10256	0.21165	0.09527	0.17341	-0.03708	0.01023	0.81331	0.08845	0.19318

# APPENDIX B (continued)

	VAR290	VAR291	VAR292	VAR293	VAR294	VAR295	VAR296	VAR297	VAR298	VAR299	VAR300	VAR301
VAR613	0.05103	0.03063	0.11327	0.15672	0.14730	0.08034	0.09998	0.09754	0.10846	0.18686	0.06212	0.10442
VAR624	0.03226	0.03633	0.21708	0.61923	0.76605	0.76690	0.79261	0.61823	0.63592	0.21237	0.19240	0.35424
VAR625	0.05139	0.00219	0.24553	0.54284	0.69903	0.67814	0.71130	0.70400	0.71595	0.26396	0.22568	0.39919
VAR626	0.20189	0.16189	0.13727	0.06607	0.07226	0.08019	0.08946	0.12523	0.14439	0.38442	0.32614	0.21515
VAR629	0.15232	0.15688	0.13858	0.22898	0.27022	0.23478	0.28527	0.16893	0.20363	0.31050	0.16249	0.10117
VAR631	0.19582	0.22806	0.19636	0.24472	0.30654	0.26117	0.34941	0.35162	0.41676	0.49591	0.43013	0.25412
VAR640	0.11246	0.39356	0.16969	0.23059	0.24757	0.15223	0.21666	0.21037	0.25946	0.28797	0.21451	0.22572
VAR644	0.07450	0.04532	0.01305	0.13007	0.14368	0.08647	0.11554	0.08521	0.09996	0.06364	0.00775	0.05934
VAR673	0.19961	0.17704	0.16043	0.17752	0.20721	0.20502	0.22630	0.14991	0.18036	0.35401	0.22390	0.18895
VAR685	0.07122	0.14595	0.06303	0.12233	0.15933	0.13299	0.16424	0.12412	0.15581	0.09684	0.01357	0.15681
VAR697	0.03081	0.04087	0.11202	0.13228	0.16803	0.15721	0.18042	0.18237	0.17235	0.04348	0.00125	0.15757
VAR111	0.03494	0.13336	0.02877	0.08375	0.10244	0.11620	0.11298	0.13048	0.12081	0.07838	0.09856	0.07827
VAR119	0.01732	0.11576	0.10254	0.04963	0.02004	0.04933	0.01329	0.03198	0.01648	0.02459	0.03553	0.10963
VAR127	0.12357	0.02117	0.21544	0.13817	0.15814	0.10347	0.11827	0.11551	0.12627	0.21223	0.14610	0.18300
VAR147	0.06051	0.22692	0.17402	0.21059	0.22737	0.19580	0.21457	0.21754	0.21260	0.35069	0.18437	0.31002
VAR149	0.21770	0.17950	0.14036	0.08844	0.09886	0.09223	0.11792	0.15837	0.18758	0.46534	0.37853	0.21533
VAR150	0.21680	0.13636	0.14312	0.14789	0.15538	0.11409	0.14171	0.19413	0.22633	0.66557	0.33618	0.18243
VAR151	0.14716	0.18066	0.14171	0.29637	0.33347	0.26753	0.33262	0.22503	0.26988	0.32293	0.20058	0.09133
VAR152	0.14968	0.16764	0.12817	0.27116	0.28605	0.26949	0.28711	0.19934	0.21249	0.21195	0.20197	0.07385
VAR154	0.20370	0.22792	0.21600	0.25518	0.31678	0.26343	0.33541	0.36073	0.40540	0.58628	0.38117	0.27492
VAR155	0.17289	0.15837	0.20812	0.25618	0.29060	0.24741	0.28152	0.32378	0.32673	0.61294	0.25093	0.21788
VAR156	0.15072	0.16447	0.13584	0.19995	0.22195	0.17255	0.22263	0.21317	0.24530	0.28982	0.68654	0.09901
VAR162	0.01156	0.15269	0.08619	0.26293	0.32134	0.30179	0.37144	0.28220	0.34196	0.26221	0.18662	0.11129
VAR164	0.15240	0.06815	0.18429	0.25809	0.27829	0.19390	0.24176	0.23185	0.26411	0.25723	0.18825	0.22434
VAR165	0.24783	0.34103	0.01354	0.04376	0.04024	0.00531	0.01867	0.01455	0.02773	0.19651	0.15767	0.14683
VAR179	0.02656	0.07371	0.05779	0.28213	0.34566	0.19026	0.37576	0.29924	0.41015	0.03752	0.10181	0.10565
VAR185	0.19772	0.00582	0.13539	0.29181	0.32561	0.22971	0.30707	0.29776	0.34523	0.43204	0.34599	0.29909
VAR186	0.17811	0.05502	0.07907	0.18667	0.31999	0.20375	0.24515	0.21929	0.23513	0.33360	0.19011	0.17012
VAR187	0.18926	0.21930	0.09978	0.26603	0.32771	0.29904	0.36768	0.24825	0.29923	0.37066	0.25632	0.17851
VAR188	0.01092	0.15642	0.04467	0.20562	0.24552	0.19351	0.28282	0.19926	0.27938	0.16970	0.19280	0.10458
VAR191	0.06032	0.05593	0.14459	0.23928	0.24862	0.16578	0.22506	0.22377	0.26381	0.28401	0.17282	0.19931
VAR192	0.18035	0.23274	0.00408	0.01447	0.01858	0.01361	0.02640	0.00548	0.00344	0.16389	0.16485	0.14326
VAR193	0.07145	0.17700	0.02060	0.12909	0.17233	0.16362	0.17992	0.10243	0.15230	0.21510	0.08250	0.13842
VAR195	0.37560	0.19925	0.10928	0.06377	0.09131	0.06026	0.04267	0.06794	0.06197	0.18042	0.05884	0.19220
VAR196	0.06885	0.01294	0.05399	0.08914	0.10282	0.06588	0.04958	0.01223	0.01964	0.10328	0.05724	0.04797
VAR201	0.05503	0.17074	0.03374	0.11977	0.14855	0.10565	0.12458	0.07579	0.08505	0.02703	0.06184	0.05147
VAR202	0.03555	0.15841	0.03272	0.11466	0.13911	0.10040	0.11877	0.07052	0.08576	0.04416	0.07623	0.04245
VAR203	0.09855	0.14173	0.10937	0.21319	0.28523	0.24183	0.23961	0.27073	0.24685	0.16604	0.10299	0.83719
VAR206	0.03028	0.01022	0.04607	0.15034	0.17191	0.11729	0.11346	0.11009	0.09862	0.08844	0.10215	0.11620
VAR213	0.25089	0.10532	0.13554	0.06802	0.06608	0.05671	0.05414	0.05663	0.05966	0.10674	0.07535	0.13238
VAR220	0.06899	0.21377	0.09172	0.15504	0.19480	0.14115	0.19191	0.15464	0.19139	0.13410	0.19125	0.17538
VAR222	0.04416	0.06481	0.09944	0.10671	0.16831	0.17961	0.19523	0.17975	0.16764	0.08193	0.00350	0.14932
VAR251	0.11538	0.11534	0.11432	0.12104	0.16177	0.10261	0.17511	0.13552	0.16279	0.19268	0.18401	0.13915
VAR276	0.01707	0.04071	0.01635	0.07147	0.06293	0.06149	0.07459	0.10004	0.10907	0.04848	0.21404	0.00469
VAR278	0.05364	0.21035	0.02671	0.04341	0.02450	0.02585	0.02293	0.05362	0.04192	0.03239	0.04361	0.04461
VAR282	0.10927	0.13673	0.28230	0.36647	0.44230	0.43518	0.42937	0.35255	0.34877	0.41564	0.22975	0.31742
VAR288	0.11996	0.02981	0.08236	0.05908	0.07508	0.06946	0.08380	0.07767	0.11006	0.17600	0.43146	0.08403
VAR289	0.01686	0.00513	0.10025	0.24560	0.21651	0.16279	0.17673	0.16455	0.15576	0.18652	0.06299	0.05663
VAR290	1.00000	0.17102	0.04263	0.01640	0.00011	0.06730	0.03932	0.10015	0.06494	0.14929	0.09107	0.04172
VAR291	0.17102	1.00000	0.08778	0.11492	0.10521	0.02308	0.06616	0.05551	0.08531	0.14308	0.09948	0.13027
VAR292	0.04263	0.08778	1.00000	0.13280	0.17831	0.16028	0.14412	0.10479	0.11341	0.12988	0.08448	0.14454
VAR293	0.11492	0.10521	0.13280	1.00000	0.87310	0.52997	0.58710	0.58206	0.57942	0.18383	0.13448	0.24213
VAR294	0.08731	0.05297	0.08731	0.87310	1.00000	0.65010	0.78448	0.61731	0.68203	0.21354	0.17276	0.33229
VAR295	0.05297	0.08731	0.05297	0.08731	0.05297	1.00000	0.85313	0.61083	0.55442	0.14667	0.11009	0.31479
VAR296	0.03932	0.06616	0.14412	0.58710	0.78448	0.85313	1.00000	0.64076	0.74800	0.18196	0.16917	0.30089
VAR297	0.10015	0.05551	0.10479	0.58206	0.61731	0.61083	0.64076	1.00000	0.90766	0.22518	0.18639	0.28216
VAR298	0.06494	0.08531	0.11341	0.57942	0.68203	0.55442	0.74800	0.90766	1.00000	0.24125	0.21944	0.25904
VAR299	0.14929	0.14308	0.12988	0.18383	0.21354	0.14667	0.18196	0.22518	0.24125	1.00000	0.24416	0.15346
VAR300	0.09107	0.09948	0.08448	0.13448	0.17276	0.11009	0.16917	0.18639	0.21944	0.24416	1.00000	0.09273
VAR301	0.04172	0.13027	0.14454	0.24213	0.33229	0.31479	0.30049	0.28216	0.25904	0.15346	0.09273	1.00000
VAR302	0.13505	0.22975	0.05120	0.23648	0.23597	0.31744	0.26661	0.27257	0.24508	0.05618	0.08157	0.20612
VAR303	0.11829	0.17348	0.12465	0.23848	0.24520	0.21146	0.22549	0.20475	0.20451	0.37224	0.18105	0.18557
VAR304	0.28055	0.07400	0.08187	0.25336	0.31465	0.34005	0.28744	0.25470	0.19904	0.18208	0.25448	0.24947
VAR305	0.24292	0.05193	0.10522	0.26820	0.33550	0.36201	0.30895	0.24824	0.18869	0.18281	0.18734	0.24947
VAR309	0.04749	0.22550	0.16025	0.37928	0.42715	0.36267	0.41767	0.35237	0.37463	0.36121	0.22763	0.24540

# APPENDIX B (continued)

	VAR302	VAR303	VAR304	VAR305	VAR309
VAR013	0.14876	0.23418	-0.13412	-0.15946	0.15485
VAR024	0.27747	0.34933	0.33651	0.36909	0.44406
VAR025	0.28693	0.24695	0.34428	0.37564	0.40541
VAR028	-0.04466	-0.25787	0.40311	0.43604	-0.33232
VAR029	-0.02603	-0.38778	0.20837	0.16162	-0.67821
VAR031	-0.11366	-0.36805	0.33382	0.32562	-0.60729
VAR040	-0.05541	-0.18308	0.04668	0.05817	-0.28200
VAR064	-0.06883	-0.06349	-0.09055	-0.11100	-0.06933
VAR073	-0.03580	-0.36788	0.28379	0.27307	-0.64231
VAR085	-0.09535	-0.15646	0.00863	-0.00681	-0.18795
VAR087	-0.09548	-0.00893	-0.20655	-0.17175	-0.08032
VAR111	-0.05693	-0.11718	0.07163	0.08067	-0.12264
VAR119	0.01558	0.10263	-0.06747	-0.09826	0.07592
VAR127	-0.03866	-0.15144	-0.06627	-0.07168	-0.16893
VAR147	0.13370	0.34583	0.05278	0.09420	0.34839
VAR149	-0.06223	-0.29294	0.43090	0.45589	-0.34186
VAR150	0.04809	0.36613	-0.39769	-0.38525	0.31874
VAR151	-0.02954	-0.51821	0.21169	0.15681	-0.69174
VAR152	0.08919	0.71985	-0.16886	-0.11860	0.44405
VAR154	-0.08640	-0.45830	0.32548	0.29935	-0.62476
VAR155	0.04800	0.58227	-0.25098	-0.21603	0.44481
VAR156	0.05980	0.24503	-0.18984	-0.17501	0.30283
VAR162	-0.12059	-0.22561	0.02735	-0.01031	-0.35538
VAR164	-0.05666	-0.21582	-0.02936	-0.02697	-0.25556
VAR165	0.02208	-0.20033	0.24619	0.21922	-0.22568
VAR179	-0.11138	-0.10060	-0.14524	-0.14099	-0.22768
VAR185	-0.07383	-0.34632	0.22255	0.22633	-0.58054
VAR186	0.03635	0.44058	-0.13026	-0.09429	0.39393
VAR187	-0.05107	-0.47694	0.27651	0.23138	-0.66256
VAR188	-0.09119	-0.14043	0.01579	0.02098	-0.30132
VAR191	-0.07824	-0.17307	0.00040	-0.00085	-0.26236
VAR192	0.02120	-0.13376	0.21919	0.21785	-0.22141
VAR193	-0.08694	-0.17219	0.12192	0.12451	-0.37458
VAR195	0.03047	0.16229	0.04165	0.03251	0.08286
VAR196	-0.05552	0.12204	-0.26224	-0.24034	0.05664
VAR201	0.03118	0.09371	0.07635	0.11666	0.07089
VAR202	0.03923	0.08698	0.04472	0.07858	0.05809
VAR203	0.15183	0.12212	0.23237	0.18491	0.22460
VAR208	0.09656	0.12592	0.04280	0.09157	0.08464
VAR213	0.01181	0.12152	0.08691	0.04520	0.10256
VAR220	0.09398	0.17042	-0.04551	-0.02401	0.21165
VAR222	0.11007	0.02758	0.18854	0.16078	0.09527
VAR251	0.10370	0.13503	-0.00579	0.02614	0.17341
VAR276	-0.02433	-0.09516	0.09032	0.17036	-0.03708
VAR278	0.01119	-0.00030	-0.03834	0.03583	0.01023
VAR282	0.14466	0.79464	0.02390	0.05798	0.61331
VAR288	0.01403	0.10509	-0.21548	-0.19200	0.08845
VAR289	0.16756	0.25184	-0.07243	-0.07913	0.19318
VAR290	-0.13505	0.11829	-0.28055	-0.29292	0.06749
VAR291	-0.02293	0.17348	-0.07608	-0.05143	0.22556
VAR292	-0.05126	-0.12465	-0.08187	-0.10522	-0.16025
VAR293	0.23648	0.23848	0.25336	0.26820	0.37928
VAR294	0.23597	0.24520	0.31465	0.33550	0.42715
VAR295	0.31744	0.21166	0.34005	0.36201	0.36267
VAR296	0.26661	0.22549	0.28744	0.30895	0.41767
VAR297	0.27257	0.20475	0.25470	0.24824	0.35237
VAR298	0.24508	0.20451	0.18939	0.18869	0.37463
VAR299	0.05618	0.37224	-0.19904	-0.18281	0.36121
VAR300	0.08157	0.18105	-0.18208	-0.18734	0.22763
VAR301	0.20612	0.14857	0.25448	0.24947	0.24545
VAR302	1.00000	0.09236	0.28693	0.29039	0.10362
VAR303	0.09236	1.00000	-0.19406	-0.14708	0.36371
VAR304	0.28693	-0.19406	1.00000	0.88094	-0.01131
VAR305	0.29039	-0.14708	0.88094	1.00000	0.00749
VAR309	0.10362	0.36371	-0.01131	0.00749	1.00000

CLASSIFICATION FOR PAROLE DECISION POLICY

SUBCONTRACTOR'S FINAL REPORT

October 1976

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## TABLE OF CONTENTS

	Page
Introduction	1
Prediction Methods Employes in the CPDP Study	2
Predictor Intercorrelation	3
Linearity	4
Additivity	6
Focus on a Dependent Variable	7
Sample Overfitting	8
Methods Used	9
Partitioning the Sample	10
 <u>Regression Analyses</u>	 13
Multiple Regression Analyses	15
Results	23
Washington	26
California	29
Virginia	30
 <u>Configural Techniques</u>	 36
Data Considerations	38
Predictive Attribute Analysis	50
CYA	52
Virginia	54
Washington	55
Association Analysis	70
CYA	71
Virginia	73
Washington	75
Validation	99
CYA	99
Virginia	100
Washington	101
Burgess Technique	114
COMPARISON OF METHODS	121
VIRGINIA - TWO YEAR PREDICTION	143
Virginia 2-Year Regression	144
Virginia 2-Year Configural Methods	147
Virginia 2-Year, Predictive Attribute Analysis	152
Virginia 2-Year, Association Analysis	159
Virginia 2-Year, Burgess	169

TABLE OF CONTENTS (continued)

	Page
VIRGINIA 2-YEAR, COMPARISON OF METHODS	172
<u>The Washington B.E. Study</u>	179
Washington B.E. Study, Regression.	198
Washington B.E. Study, Predictive Attribute Analysis	201
Washington B.E. Study, Association Analysis	207
Washington B.E. Study, Burgess	213
WASHINGTON B.E. STUDY, COMPARISON OF METHODS	215
REFERENCES	224
 LIST OF TABLES	 iii
LIST OF FIGURES	ix



# TABLES

	Page
I Characteristics of Prediction Methods Employed in the CPDP Study	10
II Data Sets Analyzed in the CPDP Risk Estimation Task	12
1 Washington	32
2 California Youth Authority	33
3 Virginia	34
4 Pentile Definitions	35
5 Variable Categories for Configural Analyses (Variable Set 1)	40
6 Variable Categories for Configural Analyses (Variable Set 2)	47
7 Terminal Subgroups Predictive Attribute Analysis - CYA/Variable Set 1	60
8 Terminal Subgroups Predictive Attribute Analysis - CYA/Variable Set 2	61
9 Terminal Subgroups Predictive Attribute Analysis - Virginia/Variable Set 1	64
10 Terminal Subgroups Predictive Attribute Analysis - Virginia/Variable Set 2	65
11 Terminal Subgroups Predictive Attribute Analysis - Washington/Variable Set 1	68
12 Terminal Subgroups Predictive Attribute Analysis - Washington/Variable Set 2	69
13 Terminal Subgroups Association Analysis CYA/Variable Set 1	80
14 Terminal Subgroups Association Analysis CYA/Variable Set 2	83

TABLES (continued)	Page
15 Terminal Subgroups Association Analysis Virginia/Variable Set 1	87
16 Terminal Subgroups Association Analysis Virginia/Variable Set 2	90
17 Terminal Subgroups Association Analysis Washington/Variable Set 1	94
18 Terminal Subgroups Association Analysis Washington/Variable Set 2	97
19 Success Rates for Terminal Subgroups Predictive Attribute Analysis - CYA/ Variable Set 1	102
20 Success Rates for Terminal Subgroups Predictive Attribute Analysis - CYA/ Variable Set 2	103
21 Success Rates for Terminal Subgroups Predictive Attribute Analysis - Virginia/ Variable Set 1	104
22 Success Rates for Terminal Subgroups Predictive Attribute Analysis - Virginia/ Variable Set 2	105
23 Success Rates for Terminal Subgroups Predictive Attribute Analysis - Washington/ Variable Set 1	106
24 Success Rates for Terminal Subgroups Predictive Attribute Analysis - Washington/ Variable Set 2	107
25 Success Rates for Terminal Subgroups Association Analysis - CYA/Variable Set 1	108
26 Success Rates for Terminal Subgroups Association Analysis - CYA/Variable Set 2	109
27 Success Rates for Terminal Subgroups Association Analysis - Virginia/Variable Set 1	110
28 Success Rates for Terminal Subgroups Association Analysis - Virginia/Variable Set 2	111

TABLES (continued)	Page
29 Success Rates for Terminal Subgroups Association Analysis - Washington/ Variable Set 1	112
30 Success Rates for Terminal Subgroups Association Analysis - Washington/ Variable Set 2	113
31 Burgess B.E. Predictor Variables - CYA	117
32 Burgess B.E. Predictor Variables - Virginia	118
33 Burgess B.E. Predictor Variables - Washington	119
34 Burgess: Variance Explained	120
35 Relative Power of Predictive Methods	126
36 Multiple Regression: Parole Expectancy Rates - CYA (Construction)	127
37 Multiple Regression: Parole Expectancy Rates - CYA (Validation)	128
38 Multiple Regression: Parole Expectancy Rates - Virginia (Construction)	129
39 Multiple Regression: Parole Expectancy Rates - Virginia (Validation)	130
40 Multiple Regression: Parole Expectancy Rates - Washington (Construction)	131
41 Multiple Regression: Parole Expectancy Rates - Washington (Validation)	132
42 Burgess: Parole Expectancy Rates - CYA Variable Set 1 (Construction)	133
43 Burgess: Parole Expectancy Rates - CYA Variable Set 1 (Validation)	134
44 Burgess: Parole Expectancy Rates - Virginia Variable Set 1 (Construction)	135
45 Burgess: Parole Expectancy Rates - Virginia Variable Set 1 (Validation)	136

TABLES (continued)	Page
46 Burgess: Parole Expectancy Rates - Washington Variable Set 1 (Construction)	137
47 Burgess: Parole Expectancy Rates - Washington Variable Set 1 (Validation)	138
48 Burgess: Parole Expectancy Rates - Virginia Variable Set 2 (Construction)	139
49 Burgess: Parole Expectancy Rates - Virginia Variable Set 2 (Validation)	140
50 Burgess: Parole Expectancy Rates - Washington Variable Set 2 (Construction)	141
51 Burgess: Parole Expectancy Rates - Washington Variable Set 2 (Validation)	142
52 Virginia, Two-Year Outcome	146
53 Variable Categories for Configural Analyses Virginia 2 Year (Variable Set 1)	148
54 Variable Categories for Configural Analyses Virginia 2 Year (Variable Set 2)	151
55 Terminal Subgroups Predictive Attribute Analysis - Virginia 2 Year/Variable Set 1	155
56 Terminal Subgroups Predictive Attribute Analysis - Virginia 2 Year/Variable Set 2	156
57 Success Rates for Terminal Subgroups Predictive Attribute Analysis - Virginia 2 Year/Variable Set 1	157
58 Success Rates for Terminal Subgroups Predictive Attribute Analysis - Virginia 2 Year/Variable Set 2	158
59 Terminal Subgroups Association Analysis Virginia 2 Year/Variable Set 1	162
60 Terminal Subgroups Association Analysis Virginia 2 Year/Variable Set 2	165
61 Success Rates for Terminal Subgroups Association Analysis - Virginia 2 Year/ Variable Set 1	167

TABLES (continued)	Page
62 Success Rates for Terminal Subgroups Association Analysis - Virginia 2 Year/ Variable Set 2	168
63a Burgess: Variance Explained	169
63 Burgess B.E. Predictor Variables Virginia 2 Year	170
64 Relative Power of Predictive Methods / Virginia 2 Year	171
65 Regression: Parole Expectancy Rates - Virginia 2 Year (Construction)	173
66 Regression: Parole Expectancy Rates - Virginia 2 Year (Validation)	174
67 Burgess: Parole Expectancy Rates - Virginia 2 Year - Variable Set 1 (Construction)	175
68 Burgess: Parole Expectancy Rates - Virginia 2 Year - Variable Set 1 (Validation)	176
69 Burgess: Parole Expectancy Rates - Virginia 2 Year - Variable Set 2 (Construction)	177
70 Burgess: Parole Expectancy Rates - Virginia 2 Year - Variable Set 2 (Validation)	178
71 Washington Department of Social and Health Services Variables	181
72 Variable Categories for Configural Analyses Washington/B.E. Study	192
73 Summary of Final Regression Equations for Washington B.E. Study Data	199
74 Terminal Subgroups Predictive Attribute Analysis - Washington/B.E. Study	203
75 Success Rates for Terminal Subgroups Predictive Attribute Analysis - Washington/ B.E. Study (Construction)	205
76 Success Rates for Terminal Subgroups Predictive Attribute Analysis - Washington/ B.E. Study	206

TABLES (continued)	Page
77 Terminal Subgroups Association Analysis Washington/B.E. Study	209
78 Success Rates for Terminal Subgroups Association Analysis - Washington/B.E. Study (Construction)	211
79 Success Rates for Terminal Subgroups Association Analysis - Washington/B.E. Study	212
80 Burgess B.E. Predictor Variables - Washington/ B.E. Study	214
81 Relative Power of Predictive Methods - Washington/B.E. Study	217
82 Multiple Regression: Parole Expectancy Rates Washington/B.E. Study (Construction)	218
83 Multiple Regression: Parole Expectancy Rates Washington/B.E. Study (Validation #1)	219
84 Multiple Regression: Parole Expectancy Rates Washington/B.E. Study (Validation #2)	220
85 Burgess: Parole Expectancy Rates - Washington/ B.E. Study (Construction)	221
86 Burgess: Parole Expectancy Rates - Washington/ B.E. Study (Validation #1)	222
87 Burgess: Parole Expectancy Rates - Washington/ B.E. Study (Validation #2)	223

# FIGURES

	Page
1A Predictive Attribute Analysis - CYA Variable Set 1	58
1B Predictive Attribute Analysis - CYA Variable Set 2	59
2A Predictive Attribute Analysis - Virginia Variable Set 1	62
2B Predictive Attribute Analysis - Virginia Variable Set 2	63
3A Predictive Attribute Analysis - Washington Variable Set 1	66
3B Predictive Attribute Analysis - Washington Variable Set 2	67
4A Association Analysis - CYA Variable Set 1	78
4B Association Analysis - CYA Variable Set 2	79
5A Association Analysis - Virginia Variable Set 1	85
5B Association Analysis - Virginia Variable Set 2	86
6A Association Analysis - Washington Variable Set 1	92
6B Association Analysis - Washington Variable Set 2	93
7A Predictive Attribute Analysis Virginia 2 Year - Variable Set 1	153
7B Predictive Attribute Analysis Virginia 2 Year - Variable Set 2	154
8A Association Analysis Virginia 2 Year - Variable Set 1	160
8B Association Analysis Virginia 2 Year - Variable Set 2	161
9 Predictive Attribute Analysis - Washington/B.E. Study	202

FIGURES (continued)

Page

- 10 Association Analysis - Washington/  
B.E. Study

208



TECHNICAL REPORT ON THE  
PREDICTION (RISK ESTIMATION) WORK PERFORMED FOR THE  
"CLASSIFICATION FOR PAROLE DECISION POLICY"  
(CPDP) PROJECT

Introduction

The Classification for Parole Decision Policy (CPDP) project had as one of its aims the demonstration and application of methods for structuring and explicating previously implicit parole decision policy. The intent was thus to develop explicit instruments which reflected the concerns of the decision makers but also had the advantages of a formal and public policy which structures discretion. One concern frequently expressed by parole decision makers is that of risk, or the likelihood of parole violation on commission of a new offense.

In this section efforts to develop empirically based estimates of the risk dimension are described. In these efforts Uniform Parole Reports\* (UPR) 1 year follow-up data pertaining to three paroling jurisdictions were analyzed. Two year follow-up data were also analyzed for one of these jurisdictions. In addition a second data base was available for one jurisdiction. These data were also analyzed.

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\* Neithercutt, M. G., W. H. Moseley, and E. A. Wenk  
Uniform Parole Reports: A National Correctional Data  
System. Davis, California: NCCD Research Center,  
March 1975.

A large number of prediction methods have been described which are applicable to the problem of estimating risk. Two considerations, at least, seem important in the selection of method for the development of an empirical risk measure to aid decision makers: First, is the question of accuracy or power and second, that of acceptability to the decision makers.

Power refers to accuracy with which a given empirical risk estimate approaches actual events as compared to the accuracy obtained when a different technique is employed to develop the estimate.

The second consideration, that of acceptability to decision makers, refers to the knowledge that no empirical device, regardless of its accuracy, can aid the decision process if it is not used. It was therefore felt to be advisable to present the decision making bodies with which the CPDP project worked with several different types of risk estimates so that they might select one with which they could be comfortable.

#### Prediction Methods Employed in the CPDP Study

Prediction methods available for risk estimation can be classified according to their assumptions and how they interact with the data. Specifically, the characteristics considered were those of predictor intercorrelation, linearity, additivity, focus on a dependent variable, and

sample overfitting. Each of these characteristics is described and briefly discussed below.

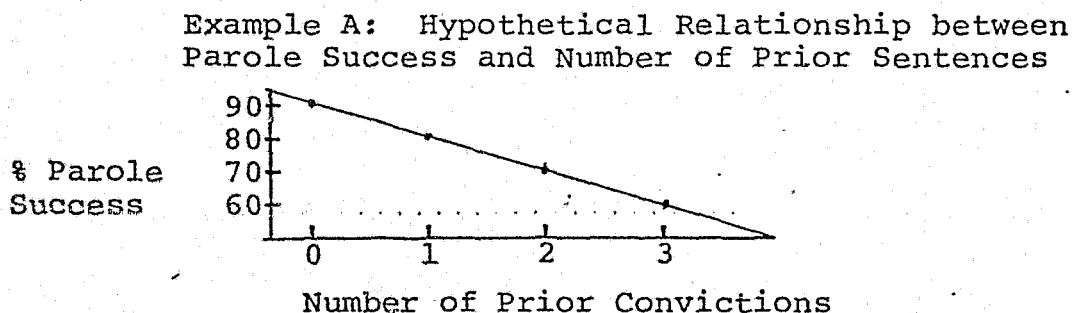
#### Predictor Intercorrelation

This characteristic refers to whether a prediction method takes into account the degree to which predictor variables are related to each other as well as to the outcome to be predicted. Suppose, for example, that first admissions to prison have a parole success rate which is 5% higher than that for the total sample. Further suppose that offenders with no prior convictions have a success rate which is 7% higher than that for the total sample. If we computed the success rate for subjects who are first admissions and have no previous convictions, what would their success rate be? We might conclude that it would be 12% above the base rate (5% plus 7%). While this estimate might at first seem reasonable, further consideration should convince us otherwise. This is because the two predictor variables, admission status and prior convictions, are related (i.e., correlated). A close examination of the relationship between these two variables reveals that a first admission is much more likely to have few or no prior convictions than is a second or third admission; and, a subject with no prior convictions is very likely to be a first admission. When we found that first admissions had a 5% higher success rate, we

"averaged in" some of the effect of also having no prior convictions. Likewise, when we computed the success rate for persons with no prior convictions, we "averaged in" some of the effect of being a first admission. Therefore, if we wish to combine information about admission status and prior record to predict parole performance, we must employ some method of estimating their unique (or independent) predictive power. Prediction methods which accomplish this are said to have accounted for predictor variable intercorrelation.

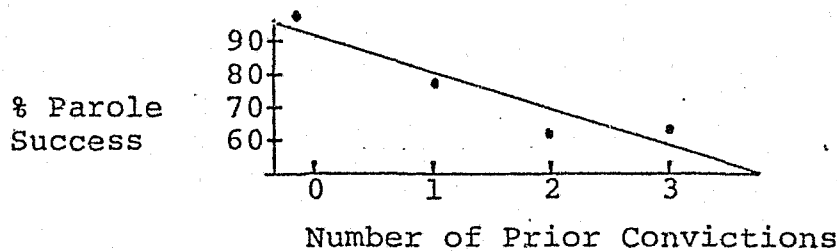
### Linearity

A linear relationship is one which can be adequately represented by a straight line. Consider, for example, a hypothetical relationship between prior convictions and parole performance: suppose that among persons with no prior convictions 90% are successful on parole, while those with one, two, or three prior convictions have success rates of 80%, 70%, and 60% respectively. Such a relationship, if found, could be represented graphically as follows:



The relationship displayed in Example A is one which is perfectly linear. Such relationships are seldom, if ever, found in social research. Rather, we usually observe relationships which are nearly linear, such as that displayed in Example B.

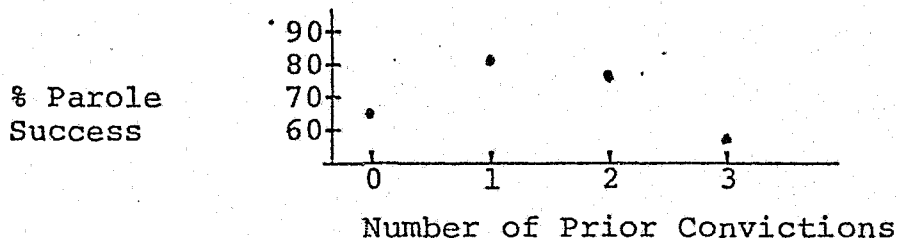
Example B:



In example B the points do not fall precisely on the line; neither do they deviate markedly from the line. Their deviations might easily arise from sample fluctuations or measurement error.

In Example C, on the other hand, it seems clear that if a true relationship exists, it is not merely the result of fluctuations about a straight line (i.e., it is a nonlinear relationship).

Example C:



To summarize, a perfect linear relationship is displayed in Example A; observations which might be obtained from sampling some linear relationship but with sampling

and measurement error are illustrated in Example B; and a relationship which is not of linear origin is shown in Example C. If the number of classes of a predictor is only two, the question of linearity does not arise since any two points describe a straight line.

### Additivity

The property of additivity holds when a predictive relation can be adequately represented through the simple addition of the independent effects of predictive variables (see predictor intercorrelation). A nonadditive relationship is one in which the dependent variable is affected not merely by the values of the independent variables but also by specific combinations of values of two or more independent variables. To illustrate, consider a situation in which we estimate the independent effect of being in the youngest age group to be a 3% lower success rate and the independent effect of being white to be a 5% lower success rate. This would lead us to expect whites in the youngest group to have an 8% (3% plus 5%) lower rate. If instead we find that these persons have a rate appreciably higher or lower than expected, we have discovered a nonadditive relationship; that is, there is some effect which results from being white and in the youngest age group which cannot be explained by the independent effects of race and age.

Two approaches can be employed to combine several variables for the purpose of predicting a criterion. A weight can be assigned to each of the predictors, for every case in the sample. This approach assumes that the predictive relation is additive; that is, the weights assigned to predictor variables are constant regardless of the combinations of variable values which may obtain for any group of individuals. Alternatively, predictors can be used to define subclasses of the total sample which differ in their distribution on the dependent measure. This approach is sensitive to nonadditive relations because subclasses are defined so that a given predictor may have relevance only for some part of the total sample.

#### Focus on a Dependent Variable

Some methods which have been suggested and employed in the prediction of parole performance are not, in the strictest sense, prediction methods at all. Methods of this type go under several labels and have several different forms. Their important characteristic for our purposes is that they do not employ a dependent variable; rather, they attempt to form groups of individuals which, with respect to several variables, are alike or have more "in common" than the total sample. The extension of these methods to prediction is based on the straightforward

assumption that subgroups which are more similar to each other in general should be more similar in a specific sense (e.g., in parole performance).

### Sample Overfitting

The adage that no two people are exactly alike is properly extended to groups of people. No two groups of subjects or other experimental elements are identical. If, however, the groups have been selected by some appropriate mechanism (i.e., random sampling), they can be expected to have a great deal in common in terms of both their overall characteristics and the interrelationships of various individual characteristics. It is this similarity of relationship within different groups of people upon which all statistical predictions ultimately rely. It is assumed, for example, that if in one group of subjects the younger do better in relation to some outcome, then in a similar group of subjects the younger will also do better. In fact, prediction methods go to some efforts to estimate, on the basis of some group of people available for study, how members of other similar groups will behave. In doing so, they run the risk of overestimating the extent to which the relationships found in one sample can be used to explain the relationships found in a similar, subsequent sample. There is no way to distinguish within the original sample alone how much of



the observed relationship is due to characteristics and underlying relationships which will be shared by new samples and how much is due to unique characteristics of the individuals comprising the first sample. Mistaking unique, peculiar variation for more general variation is referred to as "sample overfitting". As might be expected, those methods which fit the current, or construction, sample very accurately are more prone to overfitting than are those which fit the construction sample with less rigor. In addition, one of the maxims of any statistical procedure is that large samples reduce the relative importance of strictly individual variation and improve the chances that observed relationships are due to general factors and thus are likely to be observed in other groups. This implies that, ceteris paribus, predictions based on a small number of observations, like those produced by methods which employ sample subdivision, are more prone to sample overfitting than are those based on larger samples.

#### Methods Used

The methods which were selected and employed in the CPDP study are indicated in Table I below. Also shown is the rating of each method with respect to the characteristics discussed above.

As can be seen from Table I, the methods employed

TABLE I

Characteristics of Prediction Methods  
Employed in the CPDP Study

	Account for Predictor Inter- correlation?	Assume Linear Relation- ships	Assume Additive Relation- ships	Employ Dependent Variable?	Tendency for Over- fitting
Burgess	No	*	Yes	Yes	Low
Multiple Regression	Yes	Yes**	Yes	Yes	Moderate- High
Association Analysis	Yes	*	No	No	Low- Moderate
Predictive Attribute Analysis	Yes	*	No	Yes	High

\*Since all variables are dichotomized the issue of linearity does not arise.

\*\*Although the regression program employed fits only linear function, the use of variable transformations and dummy variables would allow the fitting of nonlinear function.

In the CPDP study were selected to provide a wide range of variations in the characteristics discussed. With the exception of linearity, each characteristic is present in at least one method and absent in at least one. The expected tendency to sample overfitting varies from low to high.

#### Partitioning the Sample

As noted above (see sample overfitting), the apparent power of a prediction instrument developed on a sample of observations derives from two sources. The first results

from the detection and estimation of "underlying" relationships which are likely to be observed in any similar sample of subjects. A second, and troublesome, source is the peculiar or individual properties of the specific sample. It is imperative that any prediction study which looks forward to practical application estimate the relative importance of these two sources of predictive power. Failure to do so is certain to result in an overestimation (sometimes large) of the actual utility of the instrument as a predictor. This separation is typically accomplished by randomly dividing the group under study into two samples. Predictor equations are computed using only one of these groups, the construction sample. The equation, or equations which have been developed are then applied to the other group, the validation sample. The correlation (or other measures of association) which results is an estimate of the predictive power likely to result from subsequent applications of these equations to similar groups.

This procedure, referred to as validation, was followed in the CPDP study. In Table II below paroling agency, data sources, years of release and the number of cases in the construction and validation samples are reported.

TABLE II  
DATA SETS ANALYZED  
IN THE CPDP RISK ESTIMATION TASK

Paroling Agency	Year(s) of Release	Source of Data	# in Construction Sample	# in Validation Sample
California Youth Authority	1971-1974 (male)	UPR	776	467
Virginia (1 yr follow-up)	1973 (male)	UPR	724	755
Virginia (2 yr follow-up)	1972 (male)	UPR	725	691
Washington	1971 (male)	UPR	747	716
Washington	1968-1969	Department of Social & Health Services BE Study	662	592/596*

\*Two validation samples were provided for in the design of the original study. Those groups were kept intact for our analyses.

### Regression Analyses

For the regression analyses, five of the standard UPR data items were used as they are coded. These are sentence type, prior prison, prior non-prison, drug use, and alcohol use. All remaining data were recoded or computed from existing variables. Computed items included age at admission in months and time served in months. The pentile boundaries for each of these were also computed and pentile membership included as a data item for each subject. From each of these pentile variables four dummy variables were created, one for each of pentiles one, two, four, and five. Using this scheme a subject received a score of one on the dummy variable corresponding to the pentile of which he was a member. Pentile three was omitted from the dummy variable set in order to avoid creating an overdetermined system.

Dummy variables were also created for two other variables: commitment offense and type of admission. In these cases, however, the transformation was necessary because the numerical codes assigned to each level of the variables did not bear a meaningful relationship to one another. For instance, willful homicide, code 01, is probably not 30 times better (or worse) than burglary, code 30 nor 70 times better or worse than a sexual offense,

code 70. Therefore, seventeen dummy variables were created from commitment offense, one for each offense code except "other".

Finally, parole outcome was rescaled in two ways:

- 1) return to prison = 1  
no return = 0
- 2) continued on parole = 0  
returned to prison, no violation = 1  
continued on parole with new conviction = 2  
absconder = 3  
returned to prison, technical violation  
(no new conviction and not in lieu of  
prosecution) = 4  
returned to prison, technical violation  
(new major conviction or in lieu of  
prosecution for new offense) = 5  
recommitted to prison, new major conviction = 6

Parole performance had to be recoded for the same reason as commitment offense--the codes were not related in a numerically meaningful way. Although it may be argued that our rescaling in the second case is also somewhat arbitrary, we felt that the success-fail dichotomy resulted in the loss of too much information, and that the rescaling, arbitrary though it is, might prove more useful. The dichotomy was retained in addition to the continuous scale because it has been widely used as a criterion and its interpretation is more straightforward.

### Multiple Regression Analyses

The best understanding of multiple regression can perhaps be derived from a description of the general class of "least squares" method to which it belongs. In general, a least squares method fits a model (in this case a linear model) to the data in such a way that the sum of the squares of the deviations of predicted values from actual values will be minimized. In the simplest case, we have two variables,  $X$  and  $Y$ , and we wish to predict  $Y$  from  $X$ . A least squares regression would fit a linear equation,  $Y = a + bX$ , to the data in such a way that the difference between each  $Y$  as predicted by the equation ( $\hat{Y}$ ) and the actual  $Y$  associated with the  $X$  from which the  $\hat{Y}$  was calculated, when squared and summed over all cases, will be minimized. The least squares regression method, in fact, will provide a solution which has the smallest standard error of any unbiased linear estimator. It should be emphasized here that we are fitting a linear model and, therefore, are estimating only the linear relationship of  $X$  and  $Y$ . To the extent that the predictor,  $X$  (also referred to as the independent variable), is not linearly related to the criterion,  $Y$  (or dependent variable), the regression expression is going to be deficient. This lack of predictive power is not necessarily an indication that

the method is inappropriate, but instead, perhaps, that the linear model is wrong. It is perfectly possible to fit a regression expression which assumes a nonlinear model. Other assumptions which the procedure makes besides linearity are: (1) the errors in prediction are uncorrelated with the dependent variable; (2) the measurement errors of the independent variables are uncorrelated with the variables themselves; (3) the effects of the predictive terms are additive; and (4) homoscedasticity, or equal error variance across levels of the independent variables.

Returning to the bivariate case, there are two parameters which are of interest. In the expression  $Y = a + bX$ ,  $a$  is the intercept, the  $Y$  value when  $X=0$ , while  $b$  is the slope of the regression line or the sample regression coefficient. The slope is a measure of the change in  $Y$  per unit of change in  $X$ . It is defined as the sum of the product of the deviations of  $X$  and the deviations of  $Y$  divided by the sum of the squares of the deviations of  $X$ . This means that the magnitude of the slope will be affected by the variability of  $X$ , the variability of  $Y$ , and the scaling of  $X$ , as well as the amount of relationship between  $X$  and  $Y$ . Thus, the magnitude of  $b$  is not an indication of its explanatory power, nor can slopes be compared to one another directly. The significance of a slope can be assessed, however, by



dividing it by its standard error and squaring the result. This gives an F ratio whose significance can be determined from standard F tables with df of 1 and N-2. It is also possible to standardize b so that its effect might be compared with that of other slopes. If we multiply b by the standard error of X and divide it by the standard error of Y, it will be transformed into what is known as B or beta. In this form it indicates how much change in the dependent variable is produced by a standardized change in the independent variable. Application of a regression expression to prediction of new Y's is extremely simple. The value of X from which Y is to be predicted is multiplied by the slope, b, being careful to preserve the sign, and this is added algebraically to the intercept, a.

The simple regression model can be extended in a straightforward manner to include more than one predictor. The equation then becomes  $Y_i = a + b_1X_1 + b_2X_2 + \dots + b_kX_k + e_i$ , where k is the number of independent variables. The major difference between simple and multiple regression is that in the simple case, the effects of  $X_2 \dots X_k$  are ignored and appear only as an error term. In the multiple case, each individual  $b_i$  is computed while the other specified k-1 X's are held constant. In the multiple

regression,  $b_i$  measures the expected change in  $Y$  when  $X_i$  changes by one unit and the remaining  $X$ 's remain unchanged; hence, it is called a partial regression coefficient.  $F$  statistics for testing its significance as well as  $B$  transformations may be performed in a manner analogous to that in the bivariate case.

Since there is more than one slope, it is necessary to compute a measure of the significance of the overall regression in addition to the  $F$ 's for the slopes. To do this, the variance of the predicted  $Y$ 's must be partitioned into two parts: (1) the difference between  $\hat{Y}$  and  $\bar{Y}$ ; and (2) the difference between  $\hat{Y}$  and  $Y$ . The first measure is appropriately called the deviation due to regression. The sum of the squares of these deviations may be designated  $SS_{reg}$ . The second is the deviation from regression (or about regression) and the sum of its squares will be designated  $SS_{dev}$ .

Partitioning the variance in this manner allows us to compute several useful quantities. First, if we divide  $SS_{dev}$  by  $N-k$  we get the mean of the square of the deviations ( $MS_{dev}$ ). The square root of this is the standard error of the regression and is a measure of how closely the equation fits the data.

If we divide  $SS_{dev}$  by the total sum of squares to form the ratio  $SS_{dev}/SS_{tot}$ , we have an estimate of the

variability not attributable to regression. Subtracting it from one gives us  $R^2$ , the proportion of variability in Y attributable to regression. The square root of  $R^2$  is the multiple R.

The third statistic we need is obtained by forming the ratio  $MS_{reg}/MS_{dev}$ . This is the overall F ratio and can be used to test whether the regression expression explains a significant amount of the variance of Y. A problem with this last quantity, at least with these data, is that the relatively large N practically guarantees that the F ratio will be significant, even when only a small fraction of the variance is explained. Because of this, and because we are interested in the accuracy of the prediction rather than in simply demonstrating a significant linear relationship, it is of more interest here to maximize  $R^2$ , the proportion of variance explained by regression.

$R^2$  may be thought of as a combination of the squared correlations of each predictor variable with the criterion ( $R^2_{YX_i}$ ) adjusted downward according to the intercorrelation of the predictors. In fact, if the predictors are not related to each other at all,  $R^2$  is equal to the sum of all  $R^2_{YX_i}$ . By adding variables to the expression, then, one can continuously increase  $R^2$ . There are some problems with this, however. First, if a variable being considered

is correlated with another variable already being used as a predictor, it will only increase  $R^2$  to the extent that it explains some variation in the dependent variable that the first variable missed. In other words, if they are highly intercorrelated, the second variable is quite likely to explain the same variation in the dependent variable as the first variable and so will do little besides add noise to the equation and obscure the interpretation of the supposed effect of the other variable. Worse than this, however, is the problem that the slope estimates become increasingly sensitive to sampling and measurement error as intercorrelation between predictors increases. In fact, it can be shown that very small differences in the correlation of independent variables with the dependent variable tend to produce very large differences in slopes, so that when the independent variables are highly intercorrelated, one can expect to find large differences in slope estimates from one sample to the next.

Thus, the problem we were faced with was the following: out of the 37 variables in the data base, many of which were highly intercorrelated,

which ones should we use? Which ones would provide optimum explanatory power without capitalizing on chance so much that the resultant slopes would be useful only within the current sample? In such a situation, the best method is to compute all possible regressions, using every combination of predictors, and pick the best one. Unfortunately, this was not feasible since the number of unique combinations of potential predictor variables in this data base is rather large. Instead, we performed a stepwise regression. This method relies on the use of partial correlation coefficients to choose the best predictors out of the set of all possible predictors. The partial correlation may be thought of as the correlation between a given independent variable and the dependent variable, controlling for the effects of all other independent variables. It is thus a measure of the relationship of that variable with the dependent variable which is not simply a reflection of its intercorrelation with other variables. It is a measure of the amount of explanatory power which that variable, independently, might be expected to add to the equation.

The stepwise procedure proceeds as follows: First, the independent variable with the highest correlation with the dependent variable is selected and a regression expression is calculated using it as the only predictor.

The partial correlation of each remaining independent variable with the dependent variable is computed, controlling for the variable in the equation. From these, the variable with the highest partial is selected and the regression is recomputed using both this variable and the first one selected. The partials for the remaining variables are recomputed, controlling for these two variables, and the selection procedure is repeated.

This basic procedure is complicated by three additional procedures. First, at each step a tolerance value is computed. This is a reflection of the degree of correlation of each variable with every other one. If the variance of any one variable can be completely or nearly completely explained by another variable or combination of other variables, then that variable will not be included in the expression. Second, besides the partial  $r$  and the tolerance, an  $F$  ratio is computed at each step for each variable not in the equation. This  $F$  is a measure of the significance of the slope of each variable were it to be included in the regression equation. The selection based on partial  $r$ 's is done only within the subset of those variables which would yield significant slopes. Finally, an  $F$  ratio is computed at each step for the slope of each variable already in the equation. The significance of the contribution of any

particular slope will change each time a new variable is added to the equation. If it drops below a specified F level, then that variable is removed from the equation since it is no longer contributing significantly to the prediction. Variables removed in this manner become members of the pool of variables not yet entered and are treated as such in subsequent steps.

The procedure continues as outlined above until either all independent variables are included in the equation or until none with an acceptable tolerance and F to enter remain. At this point the procedure terminates. for our purposes, however, the procedure may terminate much earlier than that. Although  $R^2$  will always increase as we add variables, and we are trying to maximize  $R^2$ , we should really add variables only as long as the increase in  $R^2$  is significant. If we include variables in the regression expression which do not cause a significant increase in  $R^2$ , we may be overfitting the equation to the sample data. In this situation we will have simply capitalized on relationships due to chance and the result will be a considerable loss of predictive power when the equation is used for prediction in another sample. For this reason, we computed an F ratio for the increase in  $R^2$  at each step over that of the previous step, and terminated the procedure when it was no longer significant.

### Results

For each participating state the stepwise regression procedure was performed twice, once using the dichotomous

dependent variable, and once predicting to the scaled parole outcome. In addition to these stepwise procedures, a mixed multiple and stepwise regression was done for Washington because of an anomalous situation which arose in the pure stepwise regression. This will be discussed in more detail in the section specific to the results for that agency. The results of the regressions are presented in Tables 1 - 3.

Columns 3-7 contain the statistics discussed previously. The last column in each table is the validation  $R^2$ , the square of the point biserial correlation between the actual parole outcome for each case in the validation sample and the prediction made by the regression expression. Since it is a measure of the variance which the regression equations can explain when applied to a sample other than the one from which they were generated, it gives a more accurate indication of their real predictive power. Comparing the construction  $R^2$  ( $R_C^2$ ) with the validation  $R^2$  ( $R_V^2$ ) gives an indication of how much we have capitalized on chance in deriving the equation.

To develop a predicted score, for each individual in the validation sample the following procedure was used: with each variable which made a significant contribution to the prediction at the last step for which there was a significant increase in  $R^2$ , (those listed in Tables 1 - 3)



a value was computed by multiplying its slope, being careful to preserve the sign, by the score on that variable which the individual possessed. These values were then summed algebraically for all variables and a constant added in.

The result was a predicted parole performance score. This could then be correlated with the actual parole outcome variable to demonstrate how accurate the predictor was. In interpreting the predicted score it should be noted, especially in the case of the scaled dependent variable, that score may not be interpreted as a prediction of a specific behavior pattern. For instance, a score of three, or close to three, does not imply that the individual will abscond; rather it indicates that he is more likely to succeed on parole than someone with a score greater than three, and less likely to do well than someone with a score of less than three.

It will be noted that in every case, the  $R^2$  for both construction and validation are at least as high, and usually higher, when predicting to the scaled parole outcome. This may or may not be a reflection of a real advantage in explanatory power, however. The correlation coefficient will be higher when the variables involved can assume a larger number of values than when the range of one or the other is restricted to a dichotomy, even if the relation-

ships are equally strong. The difference may very well be due to the loss of information inherent in reducing a multi-state item to a two-state variable. On the other hand, it is probably also true that some of the individuals we have coded as one's, as failures, are really closer to those in the success category with respect to both actual behavior and the other data we have collected. This also could certainly explain the apparent superiority of the continuously scaled criterion. Results specific to each agency will be discussed separately in the following sections.

#### Washington

From Table 1 it can be seen that there is a certain amount of overlap in the variables which are significant in predicting the two criterion variables. Admission types of two and three and offense of forgery/fraud appear in both equations and their slopes have the same signs, indicating that the relationships are in the same direction in both cases. There are, however, more significant variables in the case of the scaled dependent variable, and, as one would expect from this, the construction  $R^2$  is higher--we tend to predict better when considering more information. Somewhat surprisingly, however, the validation  $R^2$  is not only higher for the scaled dependent variable, but the reduction in explained variance was less as a percentage of the construction  $R^2$ .

It is usually the case that overfitting is greater with a more refined scale, and, therefore, the shrinkage on validation is greater. This was not the case.

Since a higher predicted parole performance means a greater likelihood of failure, the presence of those variables with a positive slope is associated with a greater likelihood of failure, and the reverse is true for those with a negative slope. In the case of predicting a continuous criterion, being older at admission is a good sign, while having a prior prison or non-prison record, an offense of forgery/fraud, being in the fourth time served pentile (serving between 20 and 28 months), and having been admitted as a parole violator, with or without a new court commitment, are all signs of increased parole risk. Additionally, being in the 5th pentile on age admission (greater than 36 years old) is a bad sign. It will be noted that age appears in the equation twice, as a raw score (negative slope) and as pentile membership (positive slope). The latter may be interpreted here as indicating an exception to the general rule of the former that older persons are better risks; the rule holds except for those who are older than 36 and these are higher than normal risks.

In the equation for the dichotomy, two types of admission (2 and 3) and an offense of either forgery/fraud, statutory rape, or vehicle theft are indications of high parole risk.

In considering these variables, however, one should bear in mind that even in the best case, predicting the scaled dependent variable, they account for less than 8% of the variance, and this shrinks to about 1.4% when applied to the validation group. While this is not unusual for these data using a sample of this size (747), it is not what one would wish for if the data were to be applied in an inferential manner to the real world.

As mentioned earlier, regression analysis of the data with the continuous criterion was performed twice. In the initial stepwise analysis there were 3 variables with significant F's to remove at the final step, 32. Only one of these, however, would have been included in the equation according to the criteria discussed earlier (stopping at the last step which the F for increase was significant). To correct this, and because of some observed suppression effects involving one of the variables, age at admission/pentile 5, in step 17, the analysis was redone. In the final run the three variables, age at admission/pentile 5, admission type = 2, and age at admission, were forced into the equation in multiple mode initially, and then the remaining variables were selected in stepwise mode. This resulted in the inclusion of 3 more significant variables in the equation and an increase in the  $R^2_C$  from .06896 to .07936.

### California

In the case of California, the variables in the equation for the continuously scaled parole performance are a proper subset of those for predicting dichotomous parole performance. The latter picked up one additional variable, offense of negligent manslaughter, and, as one would expect, a small but probably insignificant amount of explanatory power. Interestingly, however, the  $R_V^2$  for the dichotomy was less than a third as large as the  $R_V^2$  for the scaled parole performance. In fact, the  $R_V^2$  for the latter equation was more than twice as large as that for any of the other samples.

In both cases, as one might expect, having a prior non-prison sentence and having served more time are both negative indicators and, in the case of the equation for the dichotomy, so is having an offense of negligent manslaughter. Interestingly enough and contrary to the Washington results, however, being in the oldest admission age pentile (older than 21 years) is a positive thing. This is probably a reflection of the difference in the age range of the two samples. The Washington data are for adults whereas the California data are from the CYA. Finally, time served pentile = 2 (time served greater than 6.6 months and less than 8.8 months) also enters the equation as increasing the risk of failure. This indicates that,

although serving more time generally increases the likelihood of failure on parole, those serving between 6.6 and 8.8 months are even more likely to fail than persons serving more or less time. This seems rather strange. One might postulate that those with a particular offense or group of offenses might tend to serve the same amount of time and that those in this time served bracket are particularly refractory. However, if this were the case, one would also expect that adding the appropriate offense categories to the equation would then dilute the effect of the pentile membership. This was done, adding each offense group in turn, with no effect.

As with the other equation, however, the relatively low amount of variance explained by either of these equations must be considered when ascribing any real significance to the equations and their individual components.

#### Virginia:

The results of the two Virginia regression analyses present less overlap than those for the previous two agencies. The only point of overlap is in offense of vehicle theft. As one might expect, these people are an unreconstructed group and tend to fail on parole. Beyond this, when predicting to a dichotomized parole performance, having been admitted on a parole violation is a bad sign, whereas those

in prison for willful homicide seem to be better risks. On the other hand, the important predictors for the scaled dependent variable, besides vehicle theft as an offense, are presence of a prior prison record, an offense of theft or larceny, and being in the youngest age at admission pentile (age less than 20 years). These are all negative predictors (their presence indicates a greater risk). Again, a not surprising finding.

As in the other analyses, the equation for the scaled dependent variable showed greater explanatory power and validated better, although the  $R_V^2$  was lower as a function of the  $R_C^2$ . In either case, the  $R^2$  was not high enough to inspire confidence in the utility of the equation as a predictive device.

TABLE 1  
WASHINGTON

DEPENDENT VARIABLE	VARIABLES SELECTED	SLOPE	BETA	F TO REMOVE	OVERALL F	CONSTRUCTION R <sup>2</sup>	VALIDATION R <sup>2</sup>
Dichotomized Parole Performance	Admission Type=2	.09525	.11275	9.32676	6.19043	.04004	.00199
	Vehicle Theft	.11208	.10250	7.92073			
	Forgery/Fraud	.11313	.09766	7.16774			
	Statutory Rape	.26813	.08421	5.44223			
	Admission Type=3	.09569	.08388	5.17738			
	Constant	.09370					
Continuously Scaled Parole Performance	Age at Admission	-.00278	-.17324	6.98766	7.94147	.07936	.01378
	Admission Type=2	.81964	.18345	23.91849			
	Age at Admission/ Pentile 5*	.57359	.11660	3.51578			
	Prior Prison	.12908	.10345	6.08638			
	Forgery/Fraud	.62004	.10122	8.02912			
	Time Served/ Pentile 4*	.40454	.08373	5.44365			
	Admission Type=3	.55739	.09239	5.91362			
	Prior Non-Prison	.06119	.08240	4.45606			
	Constant	1.4774					

\* See Table 4 for pentile definition.



TABLE 2  
CALIFORNIA YOUTH AUTHORITY

DEPENDENT VARIABLE	VARIABLES SELECTED	SLOPE	BETA	F TO REMOVE	OVERALL F	CONSTRUCTION R <sup>2</sup>	VALIDATION R <sup>2</sup>
Dichotomized Parole Performance	Age at Admission/ Pentile 5*	-.09515	-.11463	10.02939	6.83259	.04248	.00642
	Negligent Manslaughter	.75902	.08307	5.46602			
	Prior Non-Prison	.01069	.08406	5.51803			
	Time Served/ Pentile 2*	.08290	.09911	7.30918			
	Time Served	.00445	.09525	6.51068			
	Constant	.03190					
Continuously Scaled Parole Performance	Prior Non-Prison	.09598	.13216	13.04319	8.28980	.04123	.02338
	Age at Admission/ Pentile 5*	-.49952	-.10538	8.47611			
	Time Served	.02845	.10670	8.28573			
	Time Served/ Pentile 2*	.43992	.09209	6.31312			
	Constant	.48560					

\*See Table 4 for pentile definition.

TABLE 3  
VIRGINIA

DEPENDENT VARIABLE	VARIABLES SELECTED	SLOPE	BETA	F TO REMOVE	OVERALL F	CONSTRUCTION R <sup>2</sup>	VALIDATION R <sup>2</sup>
Dichotomized Parole Performance	Vehicle Theft Willful Homocide Admission Type=2 Constant	.12152 -.07060 .13794 .0878	.08313 -.08022 .06739	5.03730 4.66708 3.80961	4.47850	.01380	.00916
Continuously Scaled Parole Performance	Prior Prison Vehicle Theft Theft or Larceny Age at Admission/ Pentile 1* Constant	.18327 .81974 .62079 .32143 .32050	.13085 .10137 .09809 .08271	12.30564 7.55696 7.19776 4.86769	7.93480	.04228	.01149

\* See Table 4 for pentile definition.

TABLE 4  
PENTILE DEFINITIONS\*

Agency	Pentile 1	Pentile 2	Pentile 3	Pentile 4	Pentile 5
WASHINGTON					
Age at Admission	0-20.51	20.51-23.64	23.64-28.40	28.40-36.36	36.36-
Time Served	0-12.05	12.05-16.18	16.18-20.13	20.13-28.08	28.08-
CALIFORNIA YOUTH AUTHORITY					
Age at Admission	0-18.82	18.82-19.40	19.40-20.01	20.01-20.83	20.83-
Time Served	0- 6.57	6.57- 8.83	8.83-11.90	11.90-14.97	14.97-
VIRGINIA					
Age at Admission	0-20.19	20.19-22.60	22.60-25.80	25.80-32.93	32.92-
Time Served	0- 9.63	9.63-15.39	15.39-24.52	24.52-44.87	44.87-

\* Age boundaries are in years; time served in months.

### Configural Techniques

Lack of power in regression predictions and/or shrinkage on validation may be due to discrepancies between data characteristics and analytic assumptions. The CPDP regression analysis, for instance, included no interaction terms in the prediction equations. In a study with large numbers of variables, the examination of individual interactions is impractical without clear theoretical guidelines. A second limitation of regression analysis derives from the calculation of regression coefficients from the matrix of zero-order correlations between variables across the entire sample population. The assumption here is that the indicated relationships hold in population subgroups; that is, the population is homogeneous.

The use of a configural approach represents, to some extent, an effort to compensate for the limitations of a regression-based prediction model "in circumstances where interactions and heterogeneities might be expected to reduce the power of multiple regression methods" (Wilkins and MacNaughton-Smith, 1964). Configural approaches allow for unspecified interactions and heterogeneities which may be present in a population and, therefore, may be characterized as being nonlinear and hierarchical. Predictive Attribute Analysis (P.A.A.) and Association Analysis (A.A.), the two configural techniques which were

applied to the study data, both classify individuals on the basis of their possession or lack of specified attributes, thus providing a typology. The potential predictive advantage of configural techniques lies in the relative lack of restrictive data assumptions. An additional practical advantage may be "that the method of combining information for any category in an expectancy table is much more readily evident to a non-mathematician in the configural tables than in those involving regression scores" (Babst, Gottfredson, and Ballard, 1968).

Both Predictive Attribute Analysis and Association Analysis proceed by classifying a heterogeneous population into reasonably homogeneous subgroups, thereby minimizing the individual variation within subgroups while maximizing the variation between subgroups. However, "[O]ften the act of classification has a primary purpose. If so, that purpose should be taken into account" (Cormack, 1971.) Accordingly, P.A.A. and A.A. can be distinguished with respect to the criteria by which the sample is partitioned. P.A.A. maximizes predictive efficiency by classifying individuals by those predictive variables which are most strongly associated with the criterion variables (i.e., parole outcome). Association Analysis, on the other hand, classifies individuals by those predictive variables which most effectively summarize shared variance on those same variables, that is,

without respect to parole outcome. The distinctive features of each technique will be discussed following some data considerations appropriate to both techniques.

#### Data Considerations<sup>4</sup>

Two versions of the study data base were used in the configural analyses. First, both Predictive Attribute Analysis and Association Analysis were performed on the same variable set utilized in the regression analyses reported above. The use of dummy categorizations in the configural analyses has two advantages: (1) strict comparability with the regression analyses was maintained and (2) the possibility of predictive relations at the extreme margins of a variable distribution was accommodated--that is, relatively fine categories (e.g., pentiles) are retained in the analysis. This version of the study data will subsequently be referred to as Variable Set 1.

It should be noted that this variable set also carries some disadvantages. Since configural techniques emphasize the predictive importance of specific combinations of attributes through successive partitioning of subgroups, the ability to test the predictive power of combinations of reasonable numbers of attributes requires the maintenance of sufficiently large subgroup N's to allow further partitioning. In many instances the highly skewed dummy categorizations would produce subgroups with very small N's,

possibly suppressing the detection of interaction effects. It was also thought that the large number of dummy categorizations and the possibility of small subgroups might contradict the simplicity and clarity of the results--one of the expected advantages of configural techniques (see p. 37 above). Therefore, a second variable set which includes only dichotomized versions of the nine independent variables was entered into a second application of the configural analyses. These simple dichotomous variables constitute Variable Set 2.

TABLE 5  
VARIABLE CATEGORIES FOR CONFIGURAL ANALYSES  
(Variable Set 1)

Variable	CYA	VIRGINIA	WASHINGTON
Admission Type = 1			
Other Admission	761 (98.1%)	683 (94.3%)	575 (77.0%)
Admission Type = 1	15 (1.9%)	41 (5.7%)	172 (23.0%)
Admission Type = 2			
Other Admission	659 (84.9%)	710 (98.1%)	560 (75.0%)
Admission Type = 2	117 (15.1%)	14 (1.9%)	187 (25.0%)
Admission Type = 3			
Other Admission	593 (76.4%)	693 (95.7%)	659 (88.2%)
Admission Type = 3	183 (23.6%)	31 (4.3%)	88 (11.8%)
Willful Homicide			
Other Offense	764 (98.5%)	640 (88.4%)	737 (98.7%)
Willful Homicide	12 (1.5%)	84 (11.6%)	10 (1.3%)
Negligent Manslaughter			
Other Offense	775 (99.9%)	720 (99.4%)	730 (97.7%)
Negligent Manslaughter	1 (0.1%)	4 (0.6%)	17 (2.3%)
Armed Robbery			
Other Offense	692 (89.2%)	616 (85.1%)	701 (93.8%)
Armed Robbery	84 (10.8%)	108 (14.9%)	46 (6.2%)
Unarmed Robbery			
Other Offense	731 (94.2%)	702 (97.0%)	724 (96.9%)
Unarmed Robbery	45 (5.8%)	22 (3.0%)	23 (3.1%)



Variable	CYA	VIRGINIA	WASHINGTON
Assault			
Other Offense	714 (92.0%)	663 (91.6%)	708 (94.8%)
Assault	62 ( 8.0%)	61 ( 8.4%)	39 ( 5.2%)
Burglary <sup>4</sup>			
Other Offense	592 (76.3%)	556 (76.8%)	561 (75.1%)
Burglary	184 (23.7%)	168 (23.2%)	186 (24.9%)
Theft or Larceny			
Other Offense	685 (88.3%)	677 (93.5%)	616 (82.5%)
Theft or Larceny	91 (11.7%)	47 ( 6.5%)	131 (17.5%)
Vehicle Theft			
Other Admission	711 (91.6%)	696 (96.1%)	651 (87.1%)
Vehicle Theft	65 ( 8.4%)	28 ( 3.9%)	96 (12.9%)
Forgery/Fraud			
Other Offense	760 (97.9%)	708 (97.8%)	663 (88.8%)
Forgery/Fraud	16 ( 2.1%)	16 ( 2.2%)	84 (11.2%)
Other Fraud			
Other Offense	776 (100.0%)	723 (99.9%)	746 (99.9%)
Other Fraud	0 ( 0.0%)	1 ( 0.1%)	1 ( 0.1%)
Forcible Rape			
Other Offense	764 (98.5%)	697 (96.3%)	742 (99.3%)
Forcible Rape	12 ( 1.5%)	27 ( 3.7%)	5 ( 0.7%)

Variable	CYA	VIRGINIA	WASHINGTON
Statutory Rape			
Other Offense	774 (99.7%)	717 (99.0%)	737 (98.7%)
Statutory Rape	2 ( 0.3%)	7 ( 1.0%)	10 ( 1.3%)
Sex Offense/Juvenile			
Other Offense	773 (99.6%)	721 (99.6%)	747 (100.0%)
Sex Offense/Juvenile	3 ( 0.4%)	3 ( 0.4%)	0 ( 0.0%)
Prostitution			
Other Offense	776 (100.0%)	724 (100.0%)	747 (100.0%)
Prostitution	0 ( 0.0%)	0 ( 0.0%)	0 ( 0.0%)
Other Sex Offense			
Other Offense	775 (99.9%)	721 (99.6%)	730 (97.7%)
Other Sex Offense	1 ( 0.1%)	3 ( 0.4%)	17 ( 2.3%)
Narcotic Offense			
Other Offense	610 (78.6%)	609 (84.1%)	710 (95.0%)
Narcotic Offense	166 (21.4%)	115 (15.9%)	37 ( 5.0%)
Alcohol Offense			
Other Offense	776 (100.0%)	724 (100.0%)	747 (100.0%)
Alcohol Offense	0 ( 0.0%)	0 ( 0.0%)	0 ( 0.0%)
Sentence Type			
Simple	600 (77.3%)	520 (71.8%)	645 (86.3%)
Multiple	176 (22.7%)	204 (28.2%)	102 (13.7%)

Variable	CYA	VIRGINIA	WASHINGTON
Prior Prison/CYA			
None	721 (92.9%)	-	-
One or More	55 ( 7.1%)	-	-
Prior Prison/Virginia			
None	-	500 (69.1%)	-
One or More	-	224 (30.9%)	-
Prior Prison/ Washington - 1			
Other	-	-	622 (83.3%)
One	-	-	125 (16.7%)
Prior Prison/ Washington - 2			
Other	-	-	581 (77.8%)
Two or More	-	-	166 (22.2%)
Prior Non-Prison/ CYA - 1			
Other	535 (68.9%)	-	-
Two or Three	241 (31.1%)	-	-
Prior Non-Prison/ CYA - 2			
Other	597 (76.9%)	-	-
Four or Five	179 (23.1%)	-	-
Prior Non-Prison/ CYA - 3			
Less than Six	571	-	-
Six or More	205 (26.4%)	-	-

Variable	CYA	VIRGINIA	WASHINGTON
Prior Non-Prison/ Virginia - 1			
Other		446 (61.6%)	-
Two to Five	-	278 (38.4%)	-
Prior Non-Prison/ Virginia - 2			
Less than Six	-	451 (62.3%)	-
Six or More	-	273 (37.7%)	-
Prior Non-Prison/ Washington - 1			
Other	-	-	581 (77.8%)
One	-	-	166 (22.2%)
Prior Non-Prison Washington - 2			
Other	-	-	558 (74.7%)
Two or Three	-	-	189 (25.3%)
Prior Non-Prison/ Washington - 3			
Less than Four	-	-	575 (77.0%)
Four or More	-	-	172 (23.0%)
Drug Use			
None or Unknown	295 (38.0%)	486 (67.1%)	501 (67.1%)
Any Use	481 (62.0%)	238 (32.9%)	246 (32.9%)
Alcohol Use			
None or Unknown	324 (41.8%)	400 (55.2%)	389 (52.1%)
Some Involvement	452 (58.2%)	324 (44.8%)	358 (47.9%)

Variable	CYA	VIRGINIA	WASHINGTON
Age at Admission/ Pentile 1			
Other Pentile	634 (81.7%)	578 (79.8%)	600 (80.3%)
First Pentile	142 (18.3%)	146 (20.2%)	147 (19.7%)
Age at Admission/ Pentile 2			
Other Pentile	606 (78.1%)	580 (80.1%)	593 (79.4%)
Second Pentile	170 (21.9%)	144 (19.9%)	154 (20.6%)
Age at Admission/ Pentile 4			
Other Pentile	621 (80.0%)	579 (80.0%)	588 (78.7%)
Fourth Pentile	155 (20.0%)	145 (20.0%)	159 (21.3%)
Age at Admission Pentile 5			
Other Pentile	626 (80.7%)	579 (80.0%)	604 (80.9%)
Fifth Pentile	150 (19.3%)	145 (20.0%)	143 (19.1%)
Time Served/Pentile 1			
Other Pentile	627 (80.8%)	575 (79.4%)	595 (79.7%)
First Pentile	149 (19.2%)	149 (20.6%)	152 (20.3%)
Time Served/Pentile 2			
Other Pentile	629 (81.1%)	582 (80.4%)	602 (80.6%)
Second Pentile	147 (18.9%)	142 (19.6%)	145 (19.4%)
Time Served/Pentile 4			
Other Pentile	611 (78.7%)	582 (80.4%)	597 (79.9%)
Fourth Pentile	165 (21.3%)	142 (19.6%)	150 (20.1%)

Variable	CYA	VIRGINIA	WASHINGTON
Time Served/Pentile 5			
Other Pentile	623 (80.3%)	579 (80.0%)	595 (79.7%)
Fifth Pentile	153 (19.7%)	145 (20.0%)	152 (20.3%)
Parole Outcome			
Success	681 (87.8%)	661 (91.3%)	628 (84.1%)
Failure	95 (12.2%)	63 ( 8.7%)	119 (15.9%)

TABLE 6  
VARIABLE CATEGORIES FOR CONFIGURAL ANALYSES  
(Variable Set 2)

Variable	CYA	VIRGINIA	WASHINGTON
Admission Type			
Other Admission	593 (76.4%)	-	-
Admission Type = 3	183 (23.6%)	-	-
Admission Type			
Other Admission	-	679 (93.8%)	472 (63.2%)
Parole Violator	-	45 (6.2%)	275 (36.8%)
Offense			
Property	599 (77.2%)	427 (59.0%)	603 (80.7%)
Person	177 (22.8%)	297 (41.0%)	144 (19.3%)
Sentence Type			
Simple	600 (77.3%)	520 (71.8%)	645 (86.3%)
Multiple	176 (22.7%)	204 (28.2%)	102 (13.7%)
Prior Prison			
None	721 (92.9%)	500 (69.1%)	456 (61.0%)
One or More	55 ( 7.1%)	224 (30.9%)	291 (39.0%)
Prior Non-Prison			
Less than Four	392 (50.5%)	-	-
Four or More	384 (49.5%)	-	-
Prior Non-Prison			
Less than Two	-	173 (23.9%)	-
Two or More	-	551 (76.1%)	-





**CONTINUED**

**3 OF 6**

Variable	CYA	VIRGINIA	WASHINGTON
Prior Non-Prison			
None	-	-	220 (29.5%)
One or More	-	-	527 (70.5%)
Drug Use			
None or Unknown	295 (38.0%)	486 (67.1%)	501 (67.1%)
Any Use	481 (62.0%)	238 (32.9%)	246 (32.9%)
Alcohol Use			
None or Unknown	324 (41.8%)	400 (55.2%)	389 (52.1%)
Some Involvement	452 (58.2%)	324 (44.8%)	358 (47.9%)
Age at Admission			
Other Pentile	626 (80.7%)	-	-
Fifth Pentile	150 (19.3%)	-	-
Age at Admission			
Other Pentile	-	578 (79.8%)	-
First Pentile	-	146 (20.2%)	-
Age at Admission			
Other Pentile	-	-	446 (59.7%)
1st/2nd Pentile	-	-	301 (40.3%)
Time Served			
Other Pentile	627 (80.8%)	-	-
First Pentile	149 (19.2%)	-	-
Time Served			
Other Pentile	-	579 (80.0%)	595 (79.7%)
Fifth Pentile	-	145 (20.0%)	152 (20.3%)

Variable	CYA	VIRGINIA	WASHINGTON
Parole Outcome			
Success	681 (87.8%)	661 (91.3%)	628 (84.1%)
Failure	95 (12.2%)	63 ( 8.7%)	119 (15.9%)

### Predictive Attribute Analysis

Because of slightly different categorization schemes, the number of variables entered into the first CPDP Predictive Attribute Analysis varies between agencies: 36 for CYA, 35 for Virginia, and 37 for Washington. For the second application of P.A.A., ten variables are used for each agency. Tables 5 and 6 present both sets of variables for each agency. Frequencies and percentages for each variable category are indicated.

P.A.A. successively subdivides a sample on the single attribute which exhibits the strongest association with the criterion. At each subdivision, the resulting subgroups are independently measured and divided again on that attribute which is most closely associated with the criterion. The process of subdivision terminates when either a specified minimum size for subgroups is reached or when no further statistically significant associations result.

Chi-squares or phi are most frequently utilized to measure the degree of association between attributes and the criterion variable. Of course, Chi-square is inappropriate as a measure of strength of association when computed for samples with differing N's. If large numbers of missing observations were excluded from the analysis, then phi, which is insensitive to N, may be a

more appropriate measure. However, missing observations are not a problem in the study data and we can assume equal N's for all bivariate relationships. Therefore, Chi-square was used for the CPDP Predictive Attribute Analysis.<sup>2</sup>

The identification of a subgroup as "terminal" was determined by one of two stopping rules:

1. A minimum terminal subgroup size was established at  $N = 50$ . Therefore, partitioning was terminated when the further division of a subgroup by any significant attribute resulted in subgroups of less than 60. If partitioning by the predictive attribute with the highest Chi-square with parole outcome would produce a subgroup of less than

---

<sup>2</sup>The Chi-square formula used for the CPDP analysis was

$$\chi^2 = \frac{N([RC-NX]-N/2)^2}{RC(N-C)(N-R)} \quad (\text{Yates corrected})$$

where,

	0	1	
1		X	R
0			
			C
			N

50, the attribute with the next highest Chi-square value was examined. This process is continued until all attributes with significant Chi-squares are exhausted or until subgroups above minimum size are achieved.

2. Subdivision is terminated when none of the candidate predictor variables produce significant Chi-squares with parole outcome ( $P < .05$ ).

Each terminal subgroup can be described in terms of attributes associated with the predictor variables which characterize it.

CYA. The way in which Predictive Attribute Analysis allows for interactions between predictor variables with respect to the criterion variable (i.e., specified interaction) is illustrated by Figure 1A. Analyzing Variable Set 1, the first split on the total CYA sample is made on Age at Admission/Pentile 5--the variable with the highest Chi-square with parole outcome. Further subdivisions of these primary subgroups, however, reflect the fact that further significant divisions occur only within certain age at admission categories. While no other CPDP variable adds predictive power for the oldest admissions group (i.e., pentile 5), Time Served/Pentile 2

was significantly related to parole outcome among other Age at Admission categories. Interaction between predictors of parole outcome is indicated; that is, the importance of variables in predicting parole outcome is not constant across categories of admission age.

The P.A.A. result derived from Variable Set 2 (Figure 1B) is slightly different. The first sample split again occurs on Age at Admission/Pentile 5, which was retained as the dichotomous version of the variable. Subsequent divisions, however, are made on Prior Non-Prison record and property/person Offense.

Predictive scores result from the assignment of a success rate to each terminal subgroup (see Table 7). To illustrate, the Variable Set 1 terminal subgroups produce observed success rates as low as 78.9% and as high as 95.3%. The former rate applies to those parolees falling within the oldest pentile for Age at Admission; the latter applies to parolees in other Age at Admission categories who fall within the second pentile of Time Served. Looking at the results for Variable Set 2 (Table 8), the most successful group is again identified by the oldest category of Age at Admission. Individuals who are not in the fifth pentile for Age at Admission and

have more than three Prior Non-Prison sentences are least successful on parole (82%). For those with less than three Prior Non-Prison sentences, those committing offenses against property have a much higher success rate (91.8%) than those committing offenses against persons (82.8%).

Virginia. For Virginia, the first two divisions for both variable sets were made on Prior Prison record and Age at Admission/Pentile 1. For Variable Set 1, however, a third subdivision was made on the basis of Burglary versus other offenses (Figures 2A and 2B).

The success rates for Variable Set 1 (Table 9) range from a low of 87.5% for parolees with a record of one or more prior prison sentences to 95.9% for those with no Prior Prison record, with Age at Admission higher than the first pentile, and with an admission offense other than Burglary. The simplicity of Variable Set 2 (Table 10) is gained at some cost in predictive power--the highest success rate is 94.9% and is attained by parolees with no Prior Prison record and who are not within the first pentile of Age at Admission.



Washington. The Washington results produce a much more complex set of divisions for Variable Set 1 than for Variable Set 2 (Figures 3A and 3B). In the former case, the primary subdivision is made according to whether the parolee fell into Admission Type 2 (parole violator without new court commitment) or not. Further subdivisions were made within each of the primary subgroups. The group characterized by Admission Type 2 was further partitioned by Burglary versus other offenses. The right branch of the analysis tree--characterized by other admission statuses--is further subdivided by Time Served/Pentile 4 and Vehicle Theft. The fact that further partitioning of each primary subgroup proceeds through different variables again demonstrates the sensitivity of P.A.A. to interactive relations.

The results for Variable Set 2 are much simpler. Parolees with no prior parole violations (Admission Type 1) form one terminal subgroup; the parole violator group (Admission Type 2 and 3) is partitioned by only one further variable--multiple or simple Sentence Type.

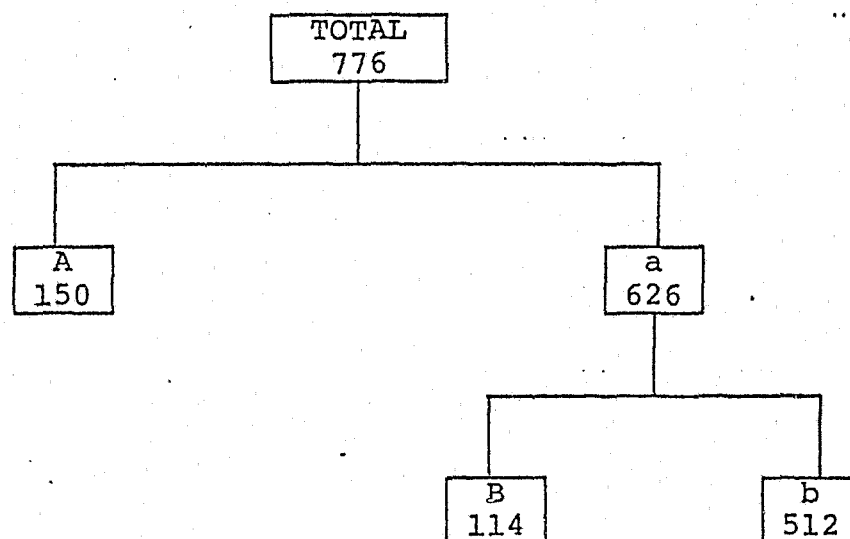
The lowest success rate (Table 11) for Variable Set 1 (72.7%) is recorded by those falling in Admission Type 2 with an offense other than Burglary. The most successful

group (90.4%) is characterized by Admission Type other than 2, Time Served other than pentile 4, and an offense other than Vehicle Theft. For Variable Set 2 (Table 12), the least successful group (73.3%) was characterized by a history of parole violations (Admission Type 1) and one or more Prior Prison sentences. The most successful group (87.7%) is distinguished simply by its lack of prior parole violations on admission.

A word of caution is in order regarding the above findings. While P.A.A. maximizes predictive power in the construction sample, there are two potential risks inherent in the process of subdivision which capitalizes on random variation in the criterion (i.e., sampling error). The first occurs with the selection of the largest Chi-square value without testing the significance among Chi-squares. Hence, the selection of an attribute may result from sampling error rather than its strength as a predictor. Secondly, the number of hypotheses tested at each subdivision (i.e., the number of attributes under consideration) raises the problem of the possible rejection of the null hypothesis when the attribute and criterion are unrelated (Ballard and Gottfredson, 1963). One result is that although P.A.A. provides a potentially more accurate prediction, "the attributes on which this prediction is based are not necessarily those which indicate the greatest general differences between the

individuals. Thus prediction may sometimes be less 'meaningful' and less widely applicable than the rather less precise prediction obtained from Association Analysis" (Wilkins and MacNaughton-Smith, 1964). In other words, Predictive Attribute Analysis is particularly sensitive to over-fitting on construction (Simon, 1972).

PREDICTIVE ATTRIBUTE ANALYSIS  
CYA -- VARIABLE SET 1



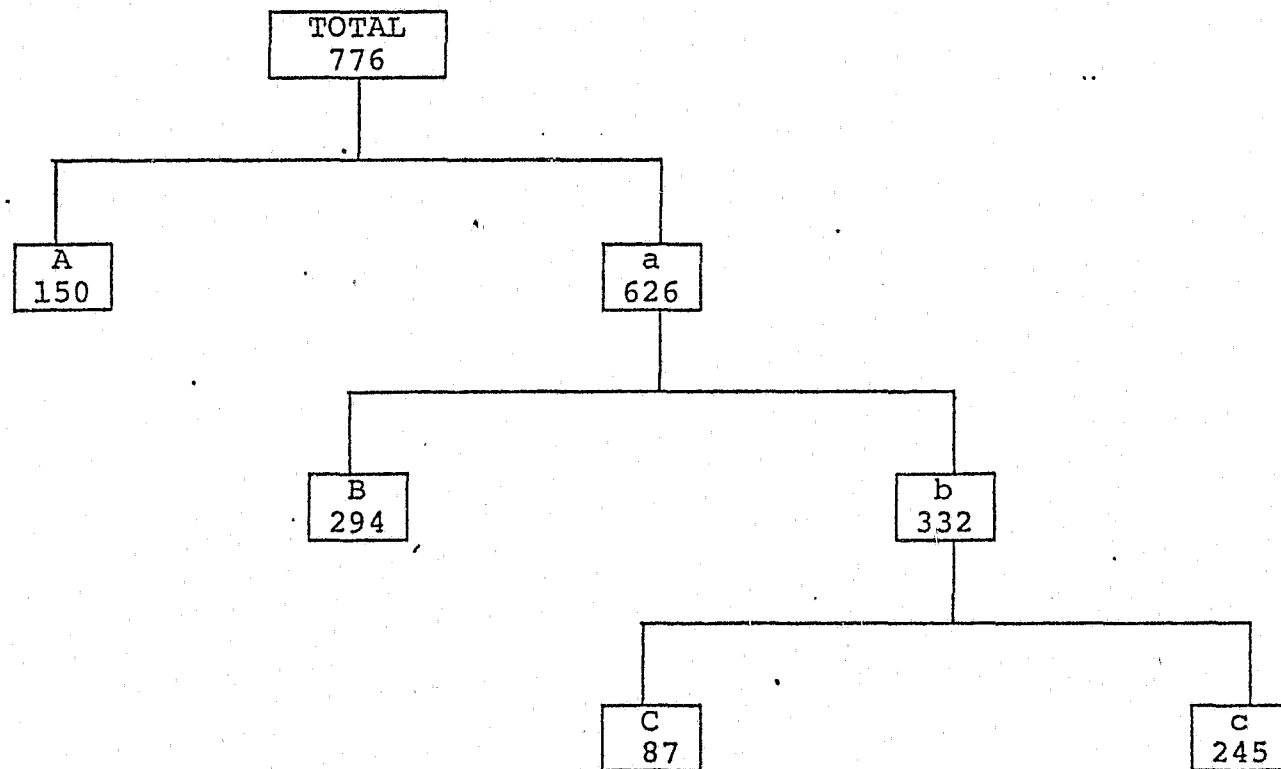
Age at Admission/Pentile 5  
Time Served/Pentile 2

A. Fifth Pentile  
B. Second Pentile

a. Other Pentile  
b. Other Pentile

Figure 1A

PREDICTIVE ATTRIBUTE ANALYSIS  
CYA - VARIABLE SET 2



Age at Admission  
Prior Non-Prison  
Offense

A. Fifth Pentile  
B. Four or More  
C. Person

a. Other Pentile  
b. Less than Four  
c. Property

Figure 1B

TABLE 7  
TERMINAL SUBGROUPS  
PREDICTIVE ATTRIBUTE ANALYSIS  
CYA/VARIABLE SET 1

TERMINAL SUBGROUP NUMBER 1

N = 150

Subgroup Characteristics: Age at Admission/Pentile 5 =  
Fifth Pentile

Success Rate = 95.3%

TERMINAL SUBGROUP NUMBER 2

N = 114

Subgroup Characteristics: Age at Admission/Pentile 5 =  
Other Pentile  
Time Served/Pentile 2 =  
Second Pentile

Success Rate = 78.9%

TERMINAL SUBGROUP NUMBER 3

N = 512

Subgroup Characteristics: Age at Admission/Pentile 5 =  
Other Pentile  
Time Served/Pentile 2 =  
Other Pentile

Success Rate = 87.5%

TABLE 8  
TERMINAL SUBGROUPS  
PREDICTIVE ATTRIBUTE ANALYSIS  
CYA/VARIABLE SET 2

TERMINAL SUBGROUP NUMBER 1

N = 150

Subgroup Characteristics: Age at Admission = Fifth  
Pentile

Success Rate = 95.3%

TERMINAL SUBGROUP NUMBER 2

N = 294

Subgroup Characteristics: Age at Admission = Other  
Pentile  
Prior Non-Prison = Four or  
More

Success Rate = 82.0%

TERMINAL SUBGROUP NUMBER 3

N = 87

Subgroup Characteristics: Age at Admission = Other  
Pentile  
Prior Non-Prison = Less than  
Four  
Offense = Person

Success Rate = 82.8%

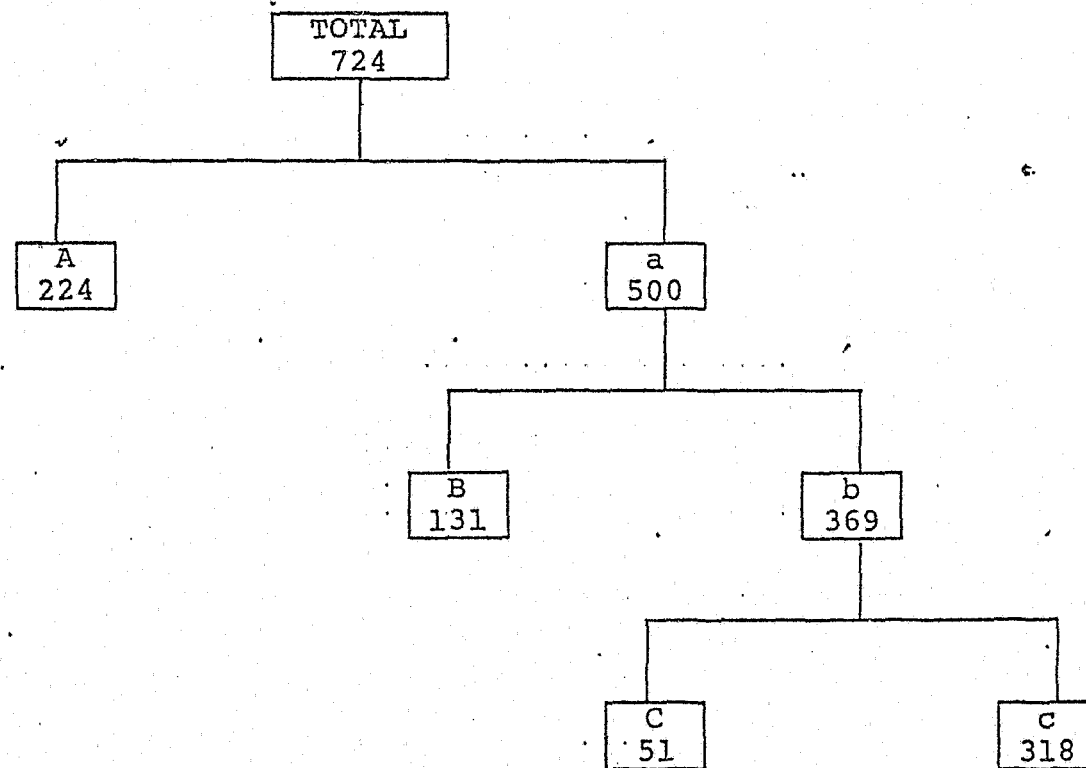
TERMINAL SUBGROUP NUMBER 4

N = 245

Subgroup Characteristics: Age at Admission = Other  
Pentile  
Prior Non-Prison = Less than  
Four  
Offense = Property

Success Rate = 91.8%

PREDICTIVE ATTRIBUTE ANALYSIS  
VIRGINIA - VARIABLE SET 1



Prior Prison  
Age at Admission/Pentile 1  
Burglary

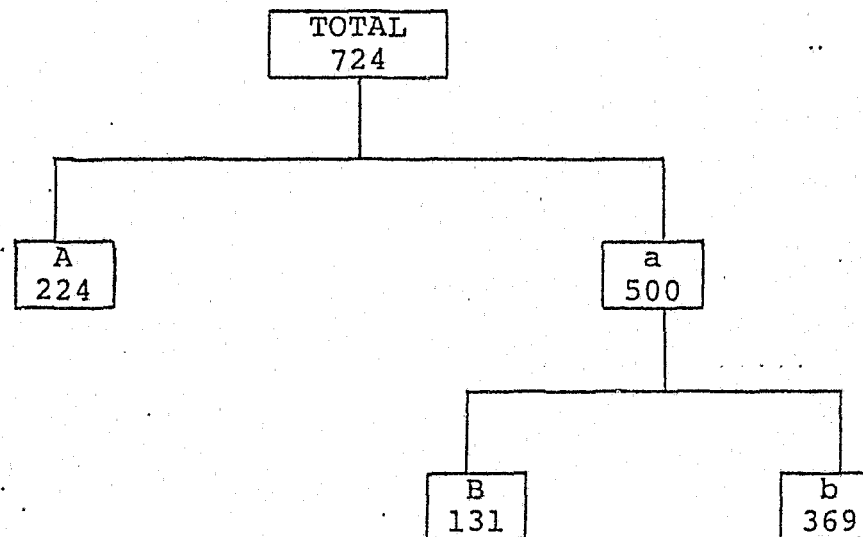
A. One or More  
B. First Pentile  
C. Burglary

a. None  
b. Other Pentile  
c. Other Offense

Figure 2A



PREDICTIVE ATTRIBUTE ANALYSIS  
VIRGINIA - VARIABLE SET 2



Prior Prison  
Age at Admission

A. One or More  
B. First Pentile

a. None  
b. Other Pentile

Figure 2B

TABLE 9  
TERMINAL SUBGROUPS  
PREDICTIVE ATTRIBUTE ANALYSIS  
VIRGINIA/VARIABLE SET 1

TERMINAL SUBGROUP NUMBER 1

N = 224

Subgroup Characteristics: Prior Prison = One or more  
Success Rate = 87.5%

TERMINAL SUBGROUP NUMBER 2

N = 131

Subgroup Characteristics: Prior Prison = None  
Age at Admission/Pentile 1 =  
First Pentile

Success Rate = 87.8%

TERMINAL SUBGROUP NUMBER 3

N = 51

Subgroup Characteristics: Prior Prison = None  
Age at Admission/Pentile 1 =  
Other Pentile  
Burglary = Burglary

Success Rate = 88.2%

TERMINAL SUBGROUP NUMBER 4

N = 318

Subgroup Characteristics: Prior Prison = None  
Age at Admission/Pentile 1 =  
Other Pentile  
Burglary = Other Offense

Success Rate = 95.9%

TABLE 10  
TERMINAL SUBGROUPS  
PREDICTIVE ATTRIBUTE ANALYSIS  
VIRGINIA/VARIABLE SET 2

TERMINAL SUBGROUP NUMBER 1

N = 224

Subgroup Characteristics: Prior Prison = One or more  
Success Rate = 87.5%

TERMINAL SUBGROUP NUMBER 2

N = 131

Subgroup Characteristics: Prior Prison = None  
Age at Admission = First  
Pentile

Success Rate = 87.8%

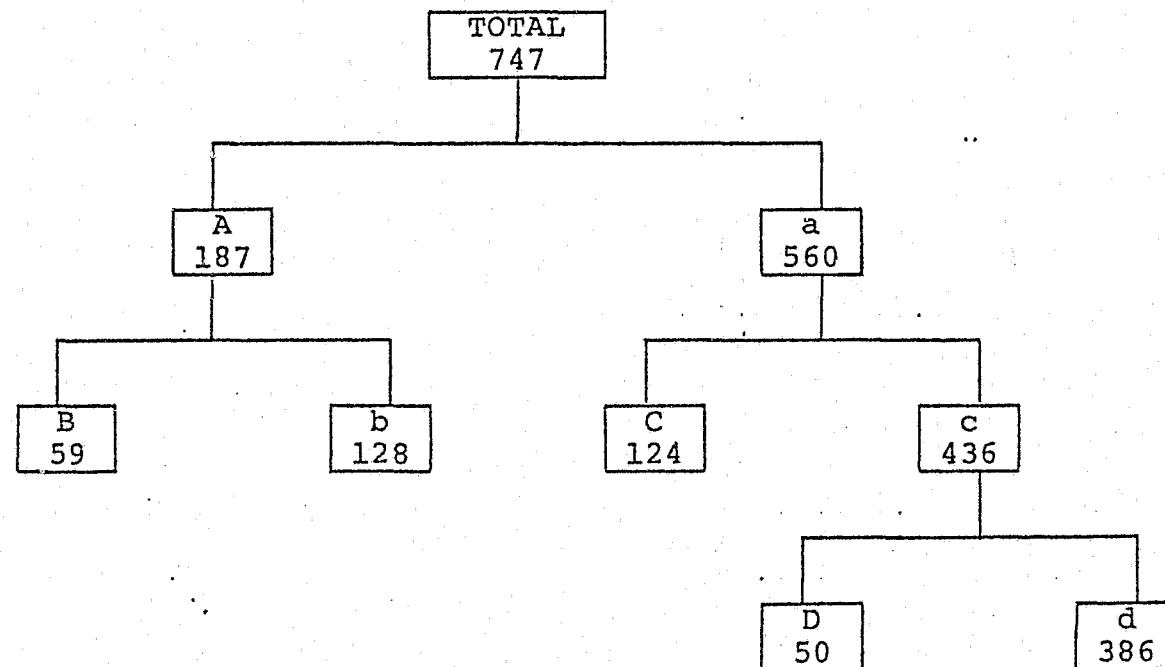
TERMINAL SUBGROUP NUMBER 3

N = 369

Subgroup Characteristics: Prior Prison = None  
Age at Admission = Other  
Pentile

Success Rate = 94.9%

PREDICTIVE ATTRIBUTE ANALYSIS  
WASHINGTON - VARIABLE SET 1



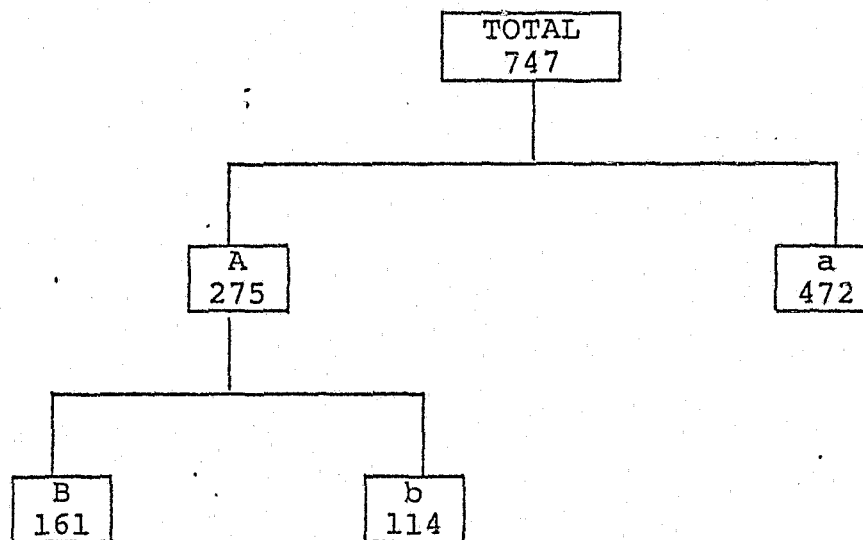
Admission Type = 2  
Burglary  
Time Served/Pentile 4  
Vehicle Theft

A. Admission Type = 2  
B. Burglary  
C. Fourth Pentile  
D. Vehicle Theft

a. Other Admission  
b. Other Offense  
c. Other Pentile  
d. Other Offense

Figure 3A

PREDICTIVE ATTRIBUTE ANALYSIS  
WASHINGTON - VARIABLE SET 2



Admission Type  
Prior Prison

A. Parole Violator  
B. One or More

a. Other Admission  
b. None

Figure 3B

TABLE 11  
TERMINAL SUBGROUPS  
PREDICTIVE ATTRIBUTE ANALYSIS  
WASHINGTON/VARIABLE SET 1

TERMINAL SUBGROUP NUMBER 1

N = 59

Subgroup Characteristics: Admission Type = 2 =  
Admission Type = 2  
Burglary = Burglary

Success Rate = 88.1%

TERMINAL SUBGROUP NUMBER 2

N = 128

Subgroup Characteristics: Admission Type = 2 =  
Admission Type = 2  
Burglary = Other Offense

Success Rate = 72.7%

TERMINAL SUBGROUP NUMBER 3

N = 124

Subgroup Characteristics: Admission Type = 2 =  
Admission Type = 2  
Time Served/Pentile 4 =  
Fourth Pentile

Success Rate = 77.4%

TERMINAL SUBGROUP NUMBER 4

N = 50

Subgroup Characteristics: Admission Type = 2 = Other  
Admission  
Time Served/Pentile 4 =  
Other Pentile  
Vehicle Theft = Vehicle Theft

Success Rate = 76.0%

TABLE 12  
TERMINAL SUBGROUPS  
PREDICTIVE ATTRIBUTE ANALYSIS  
WASHINGTON/VARIABLE SET 2

TERMINAL SUBGROUP NUMBER 1

N = 161

Subgroup Characteristics: Admission Type = Parole  
Violator  
Prior Prison = One or more

Success Rate = 73.3%

TERMINAL SUBGROUP NUMBER 2

N = 114

Subgroup Characteristics: Admission Type = Parole  
Violator  
Prior Prison = None

Success Rate = 84.2%

TERMINAL SUBGROUP NUMBER 3

N = 472

Subgroup Characteristics: Admission Type = Other  
Admission

Success Rate = 87.7%

### Association Analysis

Association Analysis proceeds by repeatedly subdividing a sample on the attribute "most closely related to all other attributes then present, i.e., that attribute which in a sense is the best single 'representative' of its fellows for the information they all contain" (Simon, 1971). As with P.A.A., the process of subdivision terminates either when a specified minimum size for subgroups is reached or when no statistically significant associations result.

Partitioning of the sample is accomplished by dividing one subgroup into two at each step on the attribute with the largest sum of Chi-square or sum of phi value. The use of sum of Chi-square or sum of phi provides a relatively stable measure since the determination for sample splitting is based on the relationship of an attribute not to just one attribute, but to many other attributes. As with Predictive Attribute Analysis, the CPDP Association Analysis relied on the Chi-square statistic rather than phi.

The sums of Chi-squares are derived from a matrix of Chi-square values of each attribute by every other attribute. As each Chi-square value is calculated, it is tested for significance at the five percent level of confidence. If, with one degree of freedom, it is insignificant, a zero is entered into the matrix rather



than the actual Chi-square value, on the assumption that the two attributes are unrelated. Then, using the entire symmetrical matrix except the principal diagonal (that is, the Chi-square value for the variable with itself), Chi-square values are summed for each column (i.e., for each attribute). If two attributes have equal sums of Chi-squares, the attribute which accounts for the most variance in the subsample (i.e., is closest to a 50-50 split) is selected. The sample is then divided on the chosen attribute. Repeating this process for each resulting subgroup, terminal subgroups result, with the application of the stopping rules outlined above in the P.A.A. discussion.

CYA. An examination of Figures 4A and 4B reveals the unspecified interaction which Association Analysis assumes. The technique allows for interactions between variables in the sense that relationships occurring in some subsets of cases are not assumed to exist in others. Looking at the results for CYA Variable Set 1, it can be seen that the total sample splits first on Age at Admission/Pentile 5, the variable with the largest sum of Chi-squares. The subgroup that is characterized by older Age at Admission (pentile 5) splits again on Prior Non-Prison/CYA-3, while the other primary subgroup (other Age at Admission) splits on Time Served/Pentile 5. This right branch of the analysis tree is further subdivided

by Time Served/Pentile 4, Prior Non-Prison/CYA-1, Narcotic Offense, Burglary, Drug Use. The analysis produced ten terminal subgroups characterized by as many as six variable attributes.

The terminal subgroup structure for Variable Set 2 was somewhat simpler: eight terminal groups with up to five defining attributes. An examination of Figure 4B also reveals a very different partitioning sequence beginning, for instance, with Admission Type rather than Age at Admission/Pentile 5.

As with P.A.A., Association Analysis assigns a success rate to each terminal subgroup to serve as a predictive score (see Table 13). The 69 individuals with Age at Admission below pentile 5, Time Served other than pentile 5 or pentile 4, no record of Narcotic Offense, no history of Drug Use, and an admission offense of Burglary, have the poorest record of parole success (82.6%) among the ten terminal subgroups for CYA Variable Set 1. The highest success rate (96.7%) was recorded by the 90 individuals falling in pentile 5 for Age at Admission and who have five or fewer Prior Non-Prison sentences.

Turning to Variable Set 2 (Table 14) we find that the least successful group of parolees (81.3%) are parole violators with a new court commitment (Admission 3) and with no known history of Drug Use. The most successful

subgroup (94.7%) is characterized by Admission Type other than 3 and a relatively advanced Age at Admission (pentile 5).

Virginia. The Association Analysis of Virginia Variable Set 1 (Figure 5A) also produced ten terminal subgroups, including between 58 and 89 individuals per group. The primary subgroup division was based on whether the parolee had a history of Drug Use. The successive split for each primary subgroup was determined by the number of Prior Non-Prison sentences. Further subdivisions proceed on six additional variables--Narcotic Offense, Age at Admission/Pentile 5, Prior Prison record, Age at Admission/Pentile 4, Age at Admission/Pentile 1, and Alcohol Use. Categories of Age at Admission are consistently related to other independent variables in Virginia.

In the analysis of Variable Set 2 (Figure 5B), seven terminal subgroups were identified on the basis of only four independent variables. The small number of significant variables which emerged in the analysis is attributable to the relative absence of important interactive relations in this particular analysis. Note that both primary subgroups (distinguished by history of Drug Use) are subdivided by Prior Prison record. The significance of the

second partitioning variable is not dependent on the value of the first. Similarly, both subcategories of Prior Prison are further subdivided by property or person Offense on the right branch of the analysis tree. The final single subgroup division is made on the parolee's history of Alcohol Use.

The least successful (84.7% parole success) subgroup identified in the analysis of Virginia Variable Set 1 (Table 15) is characterized by no known history of Drug Use, less than six Prior Non-Prison sentences, no Prior Prison sentences, and a very young (first pentile) Age at Admission. The most successful subgroup (95.9%), interestingly, shares its first three defining attributes with the low success group. It is distinct only in its more advanced Age at Admission (other than first pentile), and some known involvement with Alcohol Use.

The Association Analysis of Virginia Variable Set 2 produced a much simpler set of terminal subgroups (Table 16). Terminal Subgroup Number 1 (N = 51) has the least successful parole record (82.4% success) and includes those individuals with a history of Drug Use and with some Prior Prison record. Terminal Subgroup Number 5, the most successful type (95.3%) is characterized by no known Drug Use, no Prior Prison sentences, Offense against property, and some involvement with Alcohol Use.

Washington. Association Analysis of Washington

Variable Set 1 (Figure 6A) produced ten terminal subgroups. The first split proceeded on Age at Admission/Pentile 1. Two terminal subgroups resulting from partitioning of the youngest Admission group (pentile 1) by Admission Type (probation revoked or not). The group with more advanced Age at Admission is further divided by Age at Admission/Pentile 2, Drug Use, Time Served/Pentile 5, Prior Prison record, Prior Non-Prison record, Time Served/Pentile 4, and Time Served/Pentile 1.

Variable Set 2 (Figure 6B) produced eight terminal subgroups. With the simplified coding of the data, Prior Prison record emerges as the variable with the highest sum of Chi-squares and provides the primary sample division. Those with one or more Prior Prison sentences are further divided on the basis of Time Served and record of parole violation (Admission Type) to produce three terminal subgroups. Those with no Prior Prison record are subdivided according to Admission Type, property or person Offenses, Prior Non-Prison record, and Age at Admission.

The lowest success rate (Table 17) among the complex set of subgroups for Variable Set 1 (Subgroup Number 1)

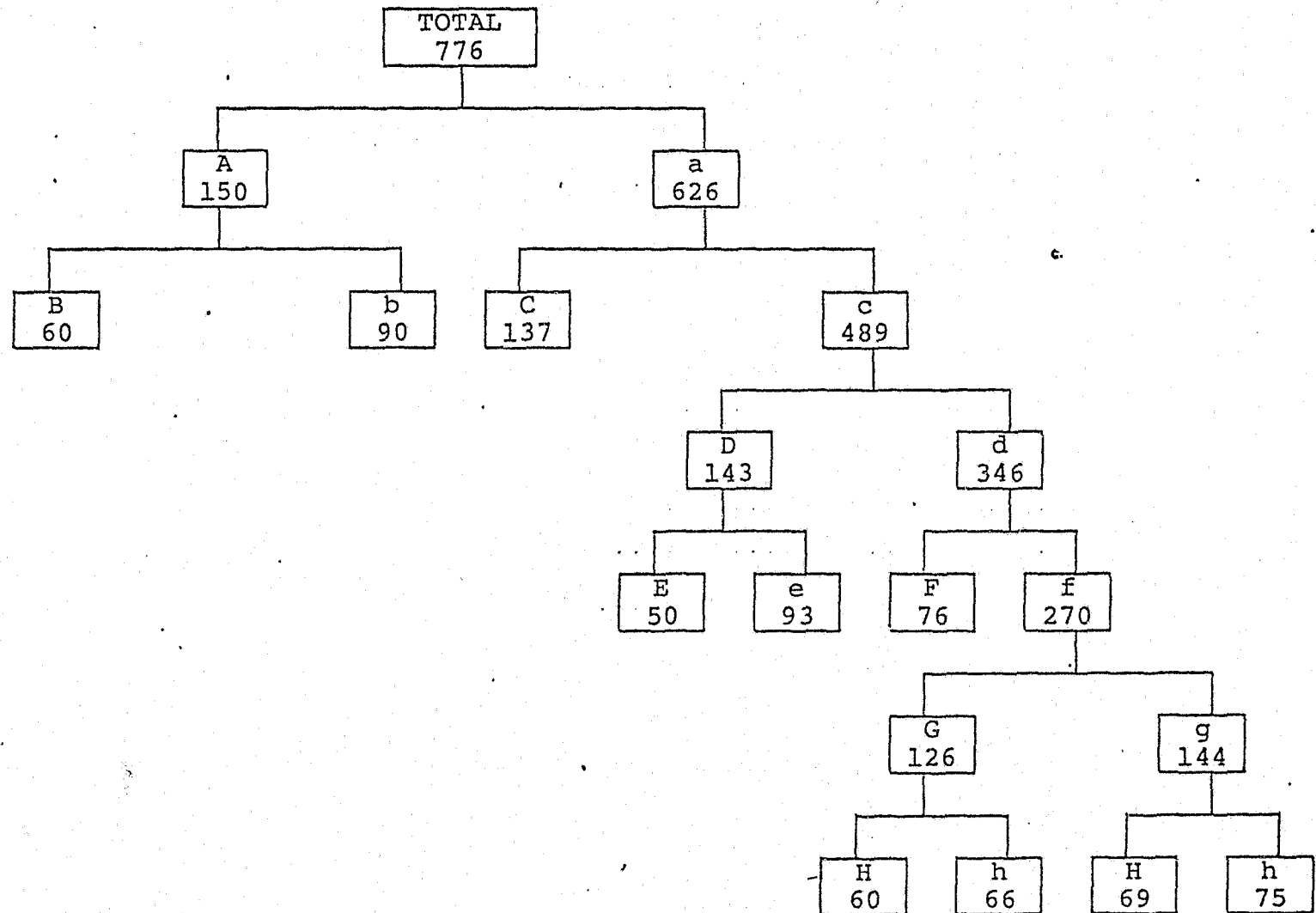
is only 6.5 percentage points below that of the most successful group (Subgroup Number 9). The former is characterized by older Age at Admission (other than pentile 1 or pentile 2), three or fewer Prior Non-Prison sentences, and Time Served (pentile 4). The latter group is different only in terms of Time Served (first pentile).

For Washington Variable Set 2 (Table 18) the least successful group recorded a success rate of 73.8%. It is composed of 130 individuals with one or more Prior Prison sentences, less than the fifth pentile for Time Served, and a record of parole violation (Admission Type). The most successful group of 79 individuals (92.4%) is distinguished by no Prior Prison record, no record of parole violation, and a person Offense.

The less than dramatic results of many of these analyses may be partly attributable to the analysis technique. Although Association Analysis is more stable and less susceptible to overfitting than P.A.A., it is, strictly speaking, not intended to be predictive. Indeed, it is predictive only to the extent that the selected attributes are themselves predictors; and, therefore, Association Analysis by itself does not ensure maximum predictive efficiency. The classifications resulting from Association Analysis are "basically descriptive rather than predictive. They could, however, be used

predictively if the contrasting homogeneous groups of individuals isolated by the method could be shown to have significantly different outcome--probabilities" (Wilkins and MacNaughton-Smith, 1964).

ASSOCIATION ANALYSIS  
CYA - VARIABLE SET 1



Age at Admission/Pentile 5  
Prior Non-Prison/CYA-3  
Time Served/Pentile 5  
Time Served/Pentile 4  
Prior Non-Prison/CYA-1  
Narcotic Offense  
Burglary  
Drug Use

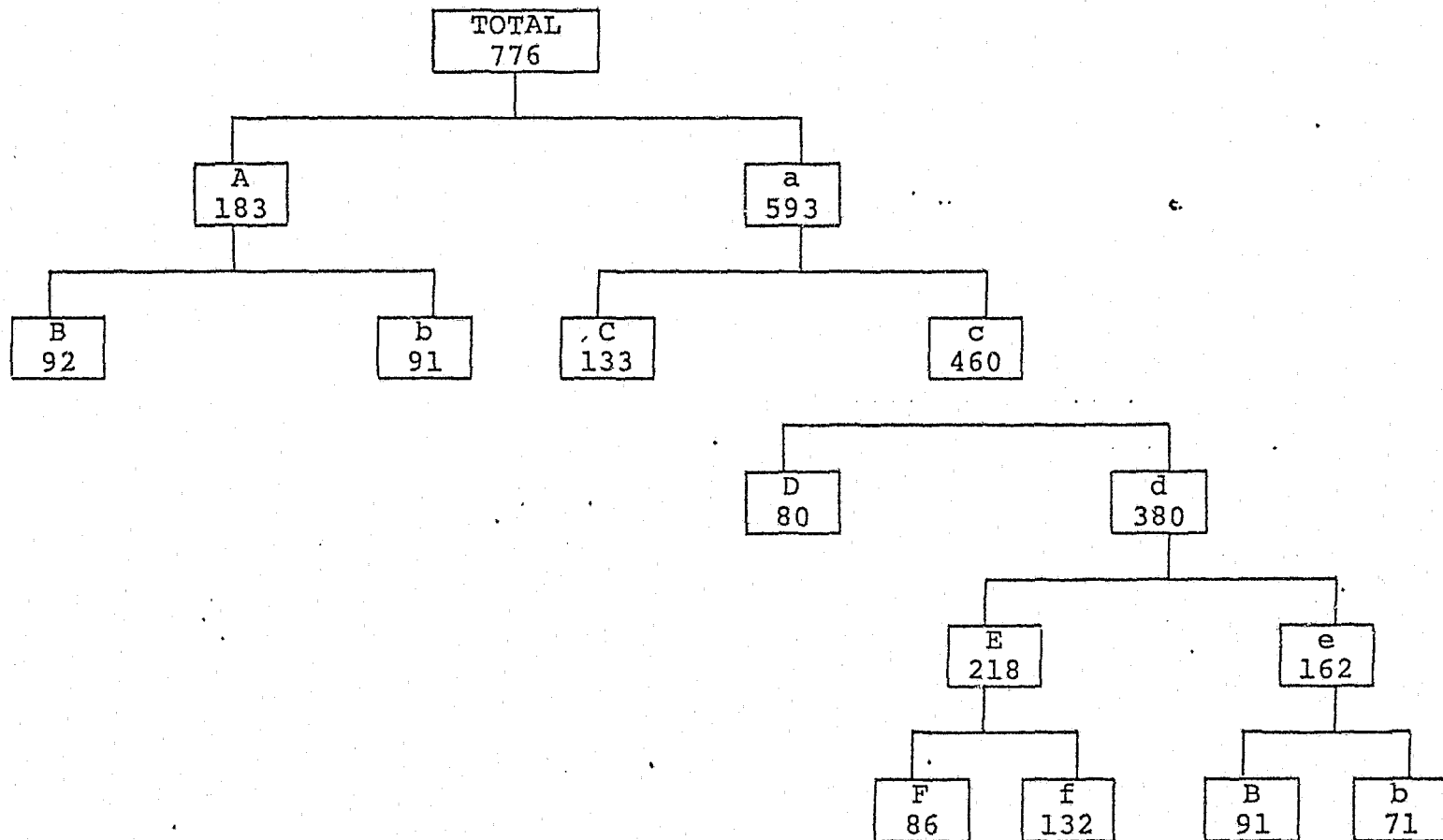
A. Fifth Pentile  
B. Six or More  
C. Fifth Pentile  
D. Fourth Pentile  
E. Two or Three  
F. Narcotic Offense  
G. Burglary  
H. Any Use

a. Other Pentile  
b. Less than Six  
c. Other Pentile  
d. Other Pentile  
e. Other  
f. Other Offense  
g. Other Offense  
h. None or Unknown

Figure 4A



ASSOCIATION ANALYSIS  
CYA - VARIABLE SET 2



Admission Type  
Drug Use  
Age at Admission  
Time Served  
Alcohol Use  
Prior Non-Prison

A. Admission Type = 3  
B. Any Use  
C. Fifth Pentile  
D. First Pentile  
E. Some Involvement  
F. Four or More

a. Other Admission  
b. None or Unknown  
c. Other Pentile  
d. Other Pentile  
e. None or Unknown  
f. Less than Four

Figure 4B

TABLE 13

TERMINAL SUBGROUPS  
ASSOCIATION ANALYSIS  
CYA/VARIABLE SET 1

TERMINAL SUBGROUP NUMBER 1

N = 60

Subgroup Characteristics: Age at Admission/Pentile 5 =  
Fifth Pentile  
Prior Non-Prison = Six or  
More

Success Rate = 93.3%

TERMINAL SUBGROUP NUMBER 2

N = 90

Subgroup Characteristics: Age at Admission/Pentile 5 =  
Fifth Pentile  
Prior Non-Prison = Less than  
Six

Success Rate = 96.7%

TERMINAL SUBGROUP NUMBER 3

N = 137

Subgroup Characteristics: Age at Admission/Pentile 5 =  
Other Pentile  
Time Served/Pentile 5 =  
Fifth Pentile

Success Rate = 83.9%

TERMINAL SUBGROUP NUMBER 4

N = 50

Subgroup Characteristics: Age at Admission/Pentile 5 =  
Other Pentile  
Time Served/Pentile 5 =  
Other Pentile  
Time Served/Pentile 4 =  
Fourth Pentile  
Prior Non-Prison = Two or  
Three

Success Rate = 90.0%

TERMINAL SUBGROUP NUMBER 5

N = 93

Subgroup Characteristics: Age at Admission/Pentile 5 =  
 Other Pentile  
 Time Served/Pentile 5 =  
 Other Pentile  
 Time Served/Pentile 4 =  
 Fourth Pentile  
 Prior Non-Prison = Other

Success Rate = 84.9%

TERMINAL SUBGROUP NUMBER 6

N = 76

Subgroup Characteristics: Age at Admission/Pentile 5 =  
 Other Pentile  
 Time Served/Pentile 5 =  
 Other Pentile  
 Time Served/Pentile 4 =  
 Other Pentile  
 Narcotic Offense =  
 Narcotic Offense

Success Rate = 89.5%

TERMINAL SUBGROUP NUMBER 7

N = 60

Subgroup Characteristics: Age at Admission/Pentile 5 =  
 Other Pentile  
 Time Served/Pentile 5 =  
 Other Pentile  
 Time Served/Pentile 4 =  
 Other Pentile  
 Narcotic Offense =  
 Other Offense  
 Burglary = Burglary  
 Drug Use = Any Use

Success Rate = 86.7%

TERMINAL SUBGROUP NUMBER 8

N = 66

Subgroup Characteristics: Age at Admission/Pentile 5 =  
 Other Pentile  
 Time Served/Pentile 5 =  
 Other Pentile  
 Time Served/Pentile 4 =  
 Other Pentile  
 Narcotic Offense =  
 Other Offense  
 Burglary = Burglary  
 Drug Use = None or Unknown

Success Rate = 86.4%

TERMINAL SUBGROUP NUMBER 9

N = 69

Subgroup Characteristics: Age at Admission/Pentile 5 =  
 Other Pentile  
 Time Served/Pentile 5 =  
 Other Pentile  
 Time Served/Pentile 4 =  
 Other Pentile  
 Narcotic Offense =  
 Other Offense  
 Burglary = Other Offense  
 Drug Use = Any Use

Success Rate = 82.6%

TERMINAL SUBGROUP NUMBER 10

N = 75

Subgroup Characteristics: Age at Admission/Pentile 5 =  
 Other Pentile  
 Time Served/Pentile 5 =  
 Other Pentile  
 Time Served/Pentile 4 =  
 Other Pentile  
 Narcotic Offense =  
 Other Offense  
 Burglary = Other Offense  
 Drug Use = None or Unknown

Success Rate = 86.7%

TABLE 14  
TERMINAL SUBGROUPS  
ASSOCIATION ANALYSIS  
CYA/VARIABLE SET 2

TERMINAL SUBGROUP NUMBER 1

N = 92

Subgroup Characteristics: Admission Type =  
Admission Type = 3  
Drug Use = Any Use

Success Rate = 89.1%

TERMINAL SUBGROUP NUMBER 2

N = 91

Subgroup Characteristics: Admission Type =  
Admission Type = 3  
Drug Use = None or Unknown

Success Rate = 81.3%

TERMINAL SUBGROUP NUMBER 3

N = 133

Subgroup Characteristics: Admission Type =  
Other Admission  
Age at Admission =  
Fifth Pentile

Success Rate = 94.7%

TERMINAL SUBGROUP NUMBER 4

N = 80

Subgroup Characteristics: Admission Type =  
Other Admission  
Age at Admission =  
Other Pentile  
Time Served =  
First Pentile

Success Rate = 93.7%

TERMINAL SUBGROUP NUMBER 5

N = 86

Subgroup Characteristics: Admission Type =  
 Other Admission  
 Age at Admission =  
 Other Pentile  
 Time Served = Other Pentile  
 Alcohol Use = Some Involvement  
 Prior Non-Prison =  
 Four or More

Success Rate = 81.4%

TERMINAL SUBGROUP NUMBER 6

N = 132

Subgroup Characteristics: Admission Type =  
 Other Admission  
 Age at Admission =  
 Other Pentile  
 Time Served = Other Pentile  
 Alcohol Use = Some Involvement  
 Prior Non-Prison = Other

Success Rate = 90.9%

TERMINAL SUBGROUP NUMBER 7

N = 91

Subgroup Characteristics: Admission Type =  
 Other Admission  
 Age at Admission =  
 Other Pentile  
 Time Served = Other Pentile  
 Alcohol Use = None or Unknown  
 Drug Use = Any Use

Success Rate = 83.5%

TERMINAL SUBGROUP NUMBER 8

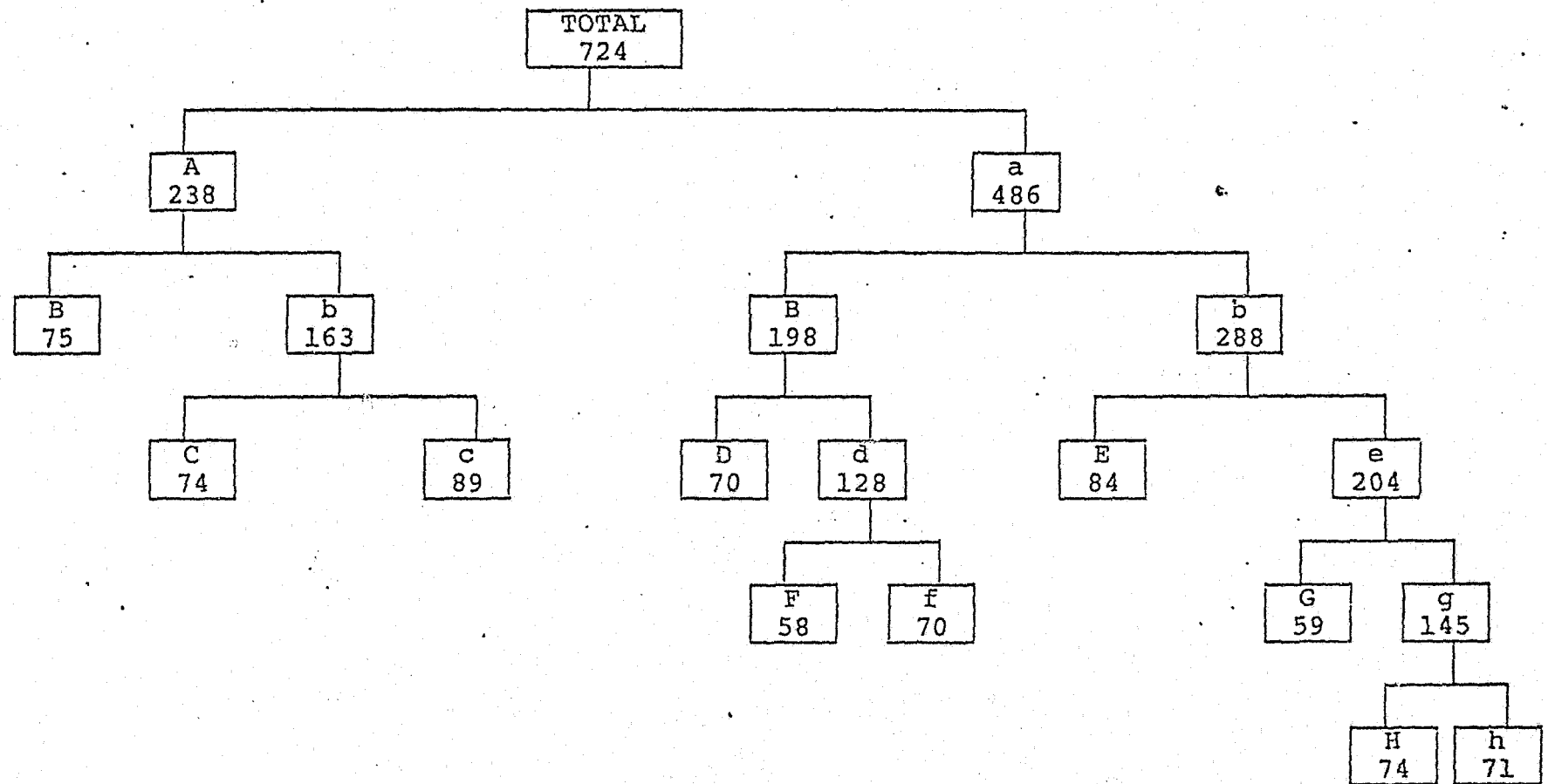
N = 74

Subgroup Characteristics: Admission Type =  
 Other Admission  
 Age at Admission =  
 Other Pentile  
 Time Served = Other Pentile  
 Alcohol Use = None or Unknown  
 Drug Use = None or Unknown

Success Rate = 81.7%



ASSOCIATION ANALYSIS  
VIRGINIA - VARIABLE SET 1



Drug Use  
Prior Non-Prison/Virginia-2  
Narcotic Offense  
Age at Admission/Pentile 5  
Prior Prison  
Age at Admission/Pentile 4  
Age at Admission/Pentile 1  
Alcohol Use

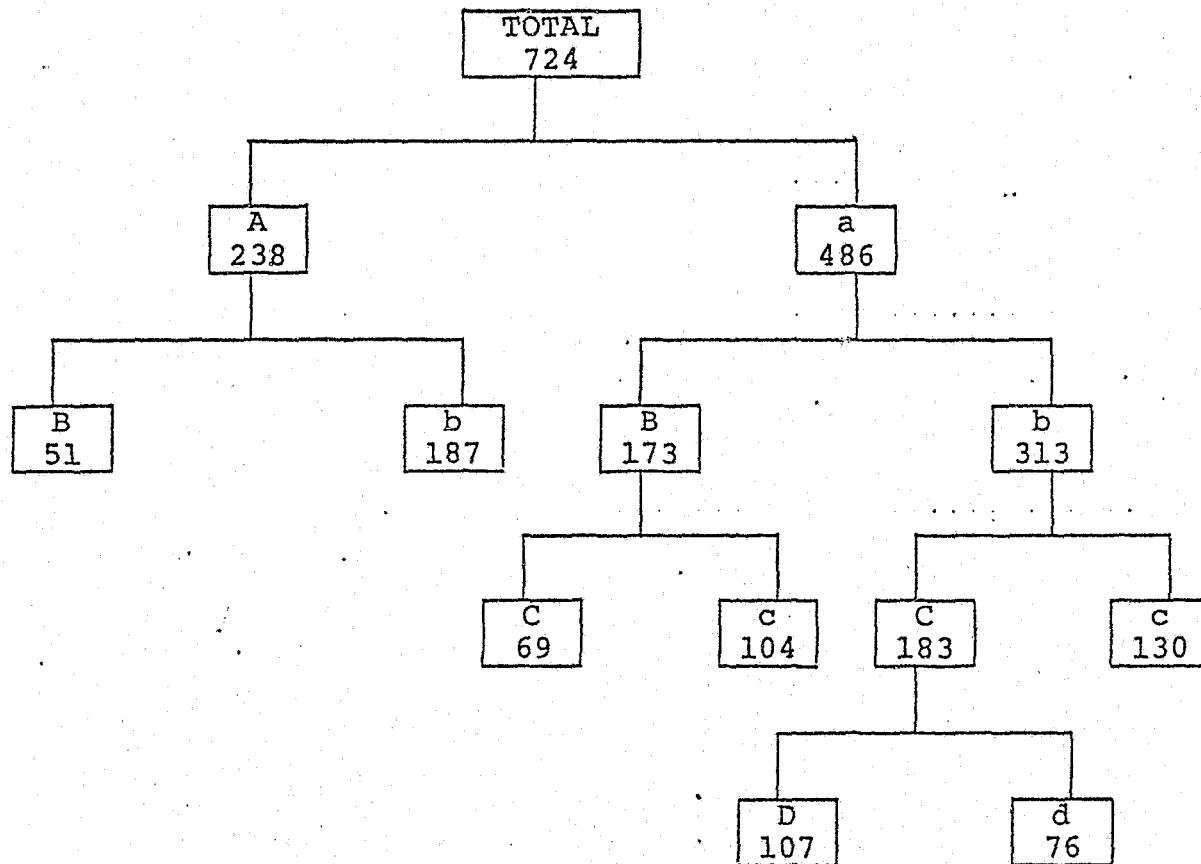
A. Any Use  
B. Six or More  
C. Narcotic Offense  
D. Fifth Pentile  
E. One or More  
F. Fourth Pentile  
G. First Pentile  
H. Some Involvement

a. None or Unknown  
b. Less than Six  
c. Other Offense  
d. Other Pentile  
e. None  
f. Other Pentile  
g. Other Pentile  
h. None or Unknown

Figure 5A



ASSOCIATION ANALYSIS  
VIRGINIA - VARIABLE SET 2



Drug Use  
Prior Prison  
Offense  
Alcohol Use

A. Any Use  
B. One or More  
C. Property  
D. Some Involvement

a. None or Unknown  
b. None  
c. Person  
d. None or Unknown

Figure 5B

## TABLE 15

TERMINAL SUBGROUPS  
ASSOCIATION ANALYSIS  
VIRGINIA/VARIABLE SET 1

TERMINAL SUBGROUP NUMBER 1

N = 75

Subgroup Characteristics: Drug Use = Any Use  
Prior Non-Prison =  
Six or More

Success Rate = 89.3%

TERMINAL SUBGROUP NUMBER 2

N = 74

Subgroup Characteristics: Drug Use = Any Use  
Prior Non-Prison =  
Less than Six  
Narcotic Offense =  
Narcotic Offense

Success Rate = 94.6%

TERMINAL SUBGROUP NUMBER 3

N = 89

Subgroup Characteristics: Drug Use = Any Use  
Prior Non-Prison =  
Less than Six  
Narcotic Offense =  
Other Offense

Success Rate = 91.0%

TERMINAL SUBGROUP NUMBER 4

N = 70

Subgroup Characteristics: Drug Use = None or Unknown  
Prior Non-Prison =  
Six or More  
Age at Admission/Pentile 5 =  
Fifth Pentile

Success Rate = 91.4%

TERMINAL SUBGROUP NUMBER 5

N = 58

Subgroup Characteristics: Drug Use = None or Unknown  
 Prior Non-Prison =  
     Six or More  
 Age at Admission/Pentile 5 =  
     Other Pentile  
 Age at Admission/Pentile 4 =  
     Fourth Pentile

Success Rate = 91.4%

TERMINAL SUBGROUP NUMBER 6

N = 70

Subgroup Characteristics: Drug Use = None or Unknown  
 Prior Non-Prison =  
     Six or More  
 Age at Admission/Pentile 5 =  
     Other Pentile  
 Age at Admission/Pentile 4 =  
     Other Pentile

Success Rate = 92.9%

TERMINAL SUBGROUP NUMBER 7

N = 84

Subgroup Characteristics: Drug Use = None or Unknown  
 Prior Non-Prison =  
     Less than Six  
 Prior Prison = One or More

Success Rate = 88.1%

TERMINAL SUBGROUP NUMBER 8

N = 59

Subgroup Characteristics: Drug Use = None or Unknown  
 Prior Non-Prison =  
     Less than Six  
 Prior Prison = None  
 Age at Admission/Pentile 1 =  
     First Pentile

Success Rate = 84.7%

TERMINAL SUBGROUP NUMBER 9

N = 74

Subgroup Characteristics: Drug Use = None or Unknown  
Prior Non-Prison =  
    Less than Six  
Prior Prison = None  
Age at Admission/Pentile 1 =  
    Other Pentile  
Alcohol Use = Some Involvement

Success Rate = 95.9%

TERMINAL SUBGROUP NUMBER 10

N = 71

Subgroup Characteristics: Drug Use = None or Unknown  
Prior Non-Prison =  
    Less than Six  
Prior Prison = None  
Age at Admission/Pentile 1 =  
    Other Pentile  
Alcohol Use = None or Unknown

Success Rate = 93.0%

TABLE 16

TERMINAL SUBGROUPS  
ASSOCIATION ANALYSIS  
VIRGINIA/VARIABLE SET 2

TERMINAL SUBGROUP NUMBER 1

N = 51

Subgroup Characteristics: Drug Use = Any Use  
Prior Prison = One or More

Success Rate = 82.4%

TERMINAL SUBGROUP NUMBER 2

N = 187

Subgroup Characteristics: Drug Use = Any Use  
Prior Prison = None

Success Rate = 94.1%

TERMINAL SUBGROUP NUMBER 3

N = 69

Subgroup Characteristics: Drug Use = None or Unknown  
Prior Prison = One or More  
Offense = Person

Success Rate = 94.2%

TERMINAL SUBGROUP NUMBER 4

N = 104

Subgroup Characteristics: Drug Use = None or Unknown  
Prior Prison = One or More  
Offense = Property

Success Rate = 85.6%

TERMINAL SUBGROUP NUMBER 5

N = 107

Subgroup Characteristics: Drug Use = None or Unknown  
Prior Prison = None  
Offense = Property  
Alcohol Use =  
Some Involvement

Success Rate = 95.3%

TERMINAL SUBGROUP NUMBER 6

N = 76

Subgroup Characteristics: Drug Use = None or Unknown  
Prior Prison = None  
Offense = Person  
Alcohol Use = None or Unknown

Success Rate = 92.1%

TERMINAL SUBGROUP NUMBER 7

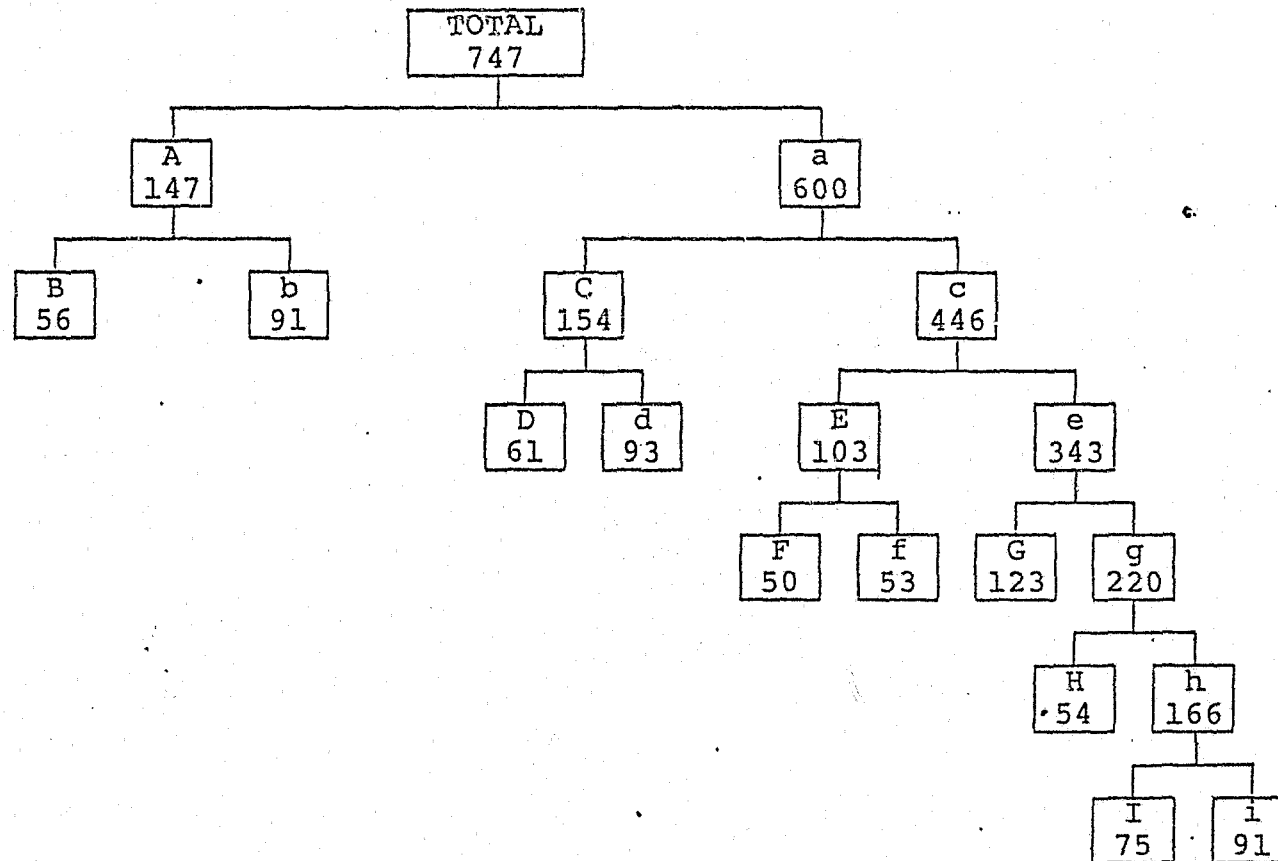
N = 130

Subgroup Characteristics: Drug Use = None or Unknown  
Prior Prison = None  
Offense = Property

Success Rate = 90.0%



ASSOCIATION ANALYSIS  
WASHINGTON - VARIABLE SET 1



Age at Admission/Pentile 1  
Admission Type = 1  
Age at Admission/Pentile 2  
Drug Use  
Time Served/Pentile 5  
Prior Prison  
Prior Non-Prison/Washington-3  
Time Served/Pentile 4  
Time Served/Pentile 1

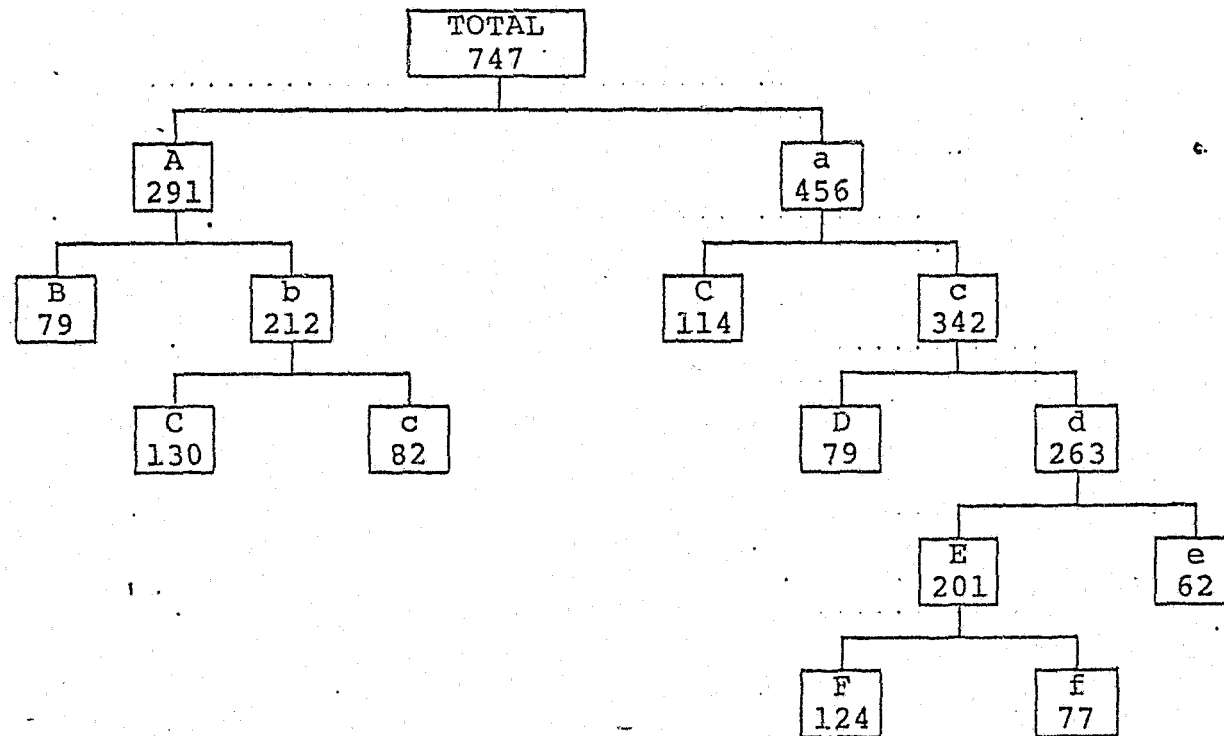
A. First Pentile  
B. Admission Type = 1  
C. Second Pentile  
D. Any Use  
E. Fifth Pentile  
F. Two or More  
G. Four or More  
H. Fourth Pentile  
I. First Pentile

a. Other Pentile  
b. Other Admission  
c. Other Pentile  
d. None or Unknown  
e. Other Pentile  
f. Other  
g. Less than Four  
h. Other Pentile  
i. Other Pentile

Figure 6A



ASSOCIATION ANALYSIS  
WASHINGTON - VARIABLE SET 2



Prior Prison  
Time Served  
Admission Type  
Offense  
Prior Non-Prison  
Age at Admission

A. One or More  
B. Fifth Pentile  
C. Parole Violator  
D. Property  
E. One or More  
F. 1st/2nd Pentile

a. None  
b. Other Pentile  
c. Other Admission  
d. Person  
e. None  
f. Other Pentile

Figure 6B

TABLE 17

TERMINAL SUBGROUPS  
ASSOCIATION ANALYSIS

WASHINGTON/VARIABLE SET 1

TERMINAL SUBGROUP NUMBER 1

N = 56

Subgroup Characteristics: Age at Admission/Pentile 1 =  
First Pentile  
Admission Type = 1 =  
Admission Type = 1

Success Rate = 83.9%

TERMINAL SUBGROUP NUMBER 2

N = 91

Subgroup Characteristics: Age at Admission/Pentile 1 =  
First Pentile  
Admission Type = 1 =  
Other Admission

Success Rate = 84.6%

TERMINAL SUBGROUP NUMBER 3

N = 61

Subgroup Characteristics: Age at Admission/Pentile 1 =  
Other Pentile  
Age at Admission/Pentile 2 =  
Second Pentile  
Drug Use = Any Use

Success Rate = 83.6%

TERMINAL SUBGROUP NUMBER 4

N = 93

Subgroup Characteristics: Age at Admission/Pentile 1 =  
Other Pentile  
Age at Admission/Pentile 2 =  
Second Pentile  
Drug Use = None or Unknown

Success Rate = 82.8%

TERMINAL SUBGROUP NUMBER 5

N = 50

Subgroup Characteristics: Age at Admission/Pentile 1 =  
 Other Pentile  
 Age at Admission/Pentile 2 =  
 Other Pentile  
 Time Served/Pentile 5 =  
 Fifth Pentile  
 Prior Prison = Two or More

Success Rate = 82.0%

TERMINAL SUBGROUP NUMBER 6

N = 53

Subgroup Characteristics: Age at Admission/Pentile 1 =  
 Other Pentile  
 Age at Admission/Pentile 2 =  
 Other Pentile  
 Time Served/Pentile 5 =  
 Fifth Pentile  
 Prior Prison = Other

Success Rate = 84.9%

TERMINAL SUBGROUP NUMBER 7

N = 123

Subgroup Characteristics: Age at Admission/Pentile 1 =  
 Other Pentile  
 Age at Admission/Pentile 2 =  
 Other Pentile  
 Time Served/Pentile 5 =  
 Other Pentile  
 Prior Non-Prison =  
 Four or More

Success Rate = 82.1%

TERMINAL SUBGROUP NUMBER 8

N = 54

Subgroup Characteristics: Age at Admission/Pentile 1 =  
 Other Pentile  
 Age at Admission/Pentile 2 =  
 Other Pentile  
 Time Served/Pentile 5 =  
 Other Pentile  
 Prior Non-Prison =  
 Less than Four  
 Time Served/Pentile 4 =  
 Fourth Pentile

Success Rate = 81.5%

TERMINAL SUBGROUP NUMBER 9

N = 75

Subgroup Characteristics: Age at Admission/Pentile 1 =  
 Other Pentile  
 Age at Admission/Pentile 2 =  
 Other Pentile  
 Time Served/Pentile 3 =  
 Other Pentile  
 Prior Non-Prison =  
 Less than Four  
 Time Served/Pentile 4 =  
 Other Pentile  
 Time Served/Pentile 1 =  
 First Pentile

Success Rate = 88.0%

TERMINAL SUBGROUP NUMBER 10

N = 91

Subgroup Characteristics: Age at Admission/Pentile 1 =  
 Other Pentile  
 Age at Admission/Pentile 2 =  
 Other Pentile  
 Time Served/Pentile 5 =  
 Other Pentile  
 Prior Non-Prison =  
 Less than Four  
 Time Served/Pentile 4 =  
 Other Pentile  
 Time Served/Pentile 1 =  
 Other Pentile

Success Rate = 86.8%

TABLE 18  
TERMINAL SUBGROUPS  
ASSOCIATION ANALYSIS  
WASHINGTON/VARIABLE SET 2

TERMINAL SUBGROUP NUMBER 1

N = 79

Subgroup Characteristics: Prior Prison = One or More  
Time Served = Fifth Pentile

Success Rate = 78.5%

TERMINAL SUBGROUP NUMBER 2

N = 130

Subgroup Characteristics: Prior Prison = One or More  
Time Served = Other Pentile  
Admission Type =  
Parole Violator

Success Rate = 73.8%

TERMINAL SUBGROUP NUMBER 3

N = 82

Subgroup Characteristics: Prior Prison = One or More  
Time Served = Other Pentile  
Admission Type =  
Other Admission

Success Rate = 89.0%

TERMINAL SUBGROUP NUMBER 4

N = 114

Subgroup Characteristics: Prior Prison = None  
Admission Type =  
Parole Violator

Success Rate = 84.2%

TERMINAL SUBGROUP NUMBER 5

N = 79

Subgroup Characteristics: Prior Prison = None  
Admission Type = Other  
Admission  
Offense = Person

Success Rate = 92.4%

TERMINAL SUBGROUP NUMBER 6

N = 124

Subgroup Characteristics: Prior Prison = None  
Admission Type = Other  
Admission  
Offense = Property  
Prior Non-Prison =  
One or More  
Age at Admission =  
1st/2nd Pentile

Success Rate = 86.3%

TERMINAL SUBGROUP NUMBER 7

N = 77

Subgroup Characteristics: Prior Prison = None  
Admission Type = Other  
Admission  
Offense = Property  
Prior Non-Prison =  
One or More  
Age at Admission =  
Other Pentile

Success Rate = 90.9%

TERMINAL SUBGROUP NUMBER 8

N = 62

Subgroup Characteristics: Prior Prison = None  
Admission Type = Other  
Admission  
Offense = Property  
Prior Non-Prison = None

Success Rate = 82.3%

### Validation

An effective predictive technique is one that provides useful information about future parole behavior. That is, the technique must be valid for groups other than that used in construction. To test the validity of the CPDP results, independent validation samples of approximately 50 percent were drawn from the original study populations (467 cases for CYA, 655 cases for Virginia, and 716 cases for Washington). All cases were sorted into subgroups corresponding to those derived from the configural analyses of the construction samples. Success rates were calculated for each validation subgroup (see Tables 19-30). The respective strength and limitations of Association Analysis and Predictive Attribute Analysis are illustrated by the validation of the configural analyses for all three study groups.

CYA. Using Variable Set 1, the Predictive Attribute Analysis of the construction sample produced an  $\eta^2$  of .0210 (i.e., classification of individuals with the P.A.A. technique explained about 2.1% of the variance in parole outcome). The construction  $\eta^2$  for Association Analysis was .0172 (i.e., about 1.7% of the variance explained). Although the results are less than dramatic, P.A.A., as expected, provided the more powerful prediction on construction. The corresponding  $\eta^2$  coefficients

for the validation sample were .0095 for P.A.A. and .0167 for A.A. Again, the results are consistent with the expected performances of the two techniques. The shrinkage between construction and validation with P.A.A. is about 1.15%. However, the A.A. analysis explains only .05% less of the variance on validation than on construction.

The configural analyses of CYA Variable Set 2 produced slightly higher  $\eta^2$  values on construction--P.A.A. = .0296, A.A. = .0276. However, shrinkage on validation was substantially greater than with Variable Set 1. Again, the extremely small validation  $\eta^2$  for P.A.A. demonstrates that technique's susceptibility to overfitting.

Virginia. In Virginia, the analysis of Variable Set 1 produced a result very similar to that for CYA. P.A.A. provides the better prediction of parole success on construction, but the P.A.A.  $\eta^2$  value is reduced by more than one half on validation. A.A., on the other hand, is more robust on validation, but is generally weak as a predictive device (i.e., the technique explained only about one percent of the variance in parole outcome on construction).

With Variable Set 2 a different pattern results. P.A.A. does not predict as well on construction and still suffers drastic shrinkage on validation. A.A., however,



predicts much more effectively on Variable Set 2-- actually producing a more accurate prediction of parole outcome on validation than on construction ( $\eta^2 = .0238$  and  $.0201$ , respectively). Here is further evidence that A.A., which does not constitute its subgroups on the basis of extreme scores on the dependent variable, is less vulnerable to the consistent regression toward the mean and chance overfitting which characterizes P.A.A.

Washington. The susceptibility of P.A.A. to shrinkage on validation is even more dramatically evident in the Washington analysis. For Variable Set 1 the relatively large construction  $\eta^2$  (.0419) virtually disappears on validation. In the analysis of Variable Set 1, A.A. again resists shrinkage on validation, though it explains very little of the variance in parole outcome on either construction or validation. For Variable Set 2, neither configural technique retains any predictive ability on validation.

TABLE 19  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 PREDICTIVE ATTRIBUTE ANALYSIS  
 CYA/VARIABLE SET 1

Group	SUCCESS		FAILURE		Total
	N	%	N	%	
CONSTRUCTION (N = 776)					
1	143	95.3	7	4.7	150
3	448	87.5	64	12.5	512
2	90	78.9	24	21.1	114
M.C.R. = .214 eta <sup>2</sup> = .0210					
VALIDATION (N = 467)					
1	90	90.9	9	9.1	99
3	231	80.8	55	19.2	286
2	65	79.3	17	20.7	82
M.C.R. = .133 eta <sup>2</sup> = .0095					

TABLE 20  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 PREDICTIVE ATTRIBUTE ANALYSIS  
 CYA/VARIABLE SET 2

Group	SUCCESS		FAILURE		Total
	N	%	N	%	
CONSTRUCTION (N = 776)					
1	143	95.3	7	4.8	150
4	225	91.8	20	8.2	245
3	72	82.8	15	17.2	87
2	241	82.0	53	18.0	294
M.C.R. = -.038 eta <sup>2</sup> = .0296					
VALIDATION (N = 467)					
1	90	90.9	9	9.1	99
4	122	79.7	31	20.3	153
3	38	92.7	3	7.3	41
2	136	78.2	38	21.8	174
M.C.R. = .143 eta <sup>2</sup> = .0047					

TABLE 21  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 PREDICTIVE ATTRIBUTE ANALYSIS  
 VIRGINIA/VARIABLE SET 1

Group	SUCCESS		FAILURE		Total
	N	%	N	%	
CONSTRUCTION (N = 724)					
4	305	95.9	13	4.1	318
3	45	88.2	6	11.8	51
2	115	87.8	16	12.2	131
1	196	87.5	28	12.5	224
M.C.R. = .260 eta <sup>2</sup> = .0210					
VALIDATION (N = 755)					
4	306	93.9	20	6.1	326
3	59	89.4	7	10.6	66
2	123	86.6	19	13.4	142
1	195	88.2	26	11.8	221
M.C.R. = .169 eta <sup>2</sup> = .0102					

TABLE 22  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 PREDICTIVE ATTRIBUTE ANALYSIS  
 VIRGINIA/VARIABLE SET 2

Group	SUCCESS		FAILURE		Total
	N	%	N	%	
CONSTRUCTION (N = 724)					
3	350	94.9	19	5.1	369
2	115	87.8	16	12.2	131
1	196	87.5	28	12.5	224
M.C.R. = .230 eta <sup>2</sup> = .0165					
VALIDATION (N = 755)					
3	365	93.1	27	6.9	392
2	123	86.6	19	13.4	142
1	195	88.2	26	11.8	221
M.C.R. = .149 eta <sup>2</sup> = .0087					

TABLE 23  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 PREDICTIVE ATTRIBUTE ANALYSIS  
 WASHINGTON/VARIABLE SET 1

Group	SUCCESS		FAILURE		Total
	N	%	N	%	
CONSTRUCTION (N = 747)					
5	349	90.4	37	9.6	386
1	52	88.1	7	11.9	59
3	96	77.4	28	22.6	124
4	38	76.0	12	24.0	50
2	93	72.7	35	27.3	128
M.C.R. = .290 eta <sup>2</sup> = .0419					
VALIDATION (N = 716)					
5	312	86.0	51	14.0	363
1	51	85.0	9	15.0	60
3	86	82.7	18	17.3	104
4	27	75.0	9	25.0	36
2	131	85.6	22	14.4	153
M.C.R. = .039 eta <sup>2</sup> = .0008					

TABLE 24  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 PREDICTIVE ATTRIBUTE ANALYSIS  
 WASHINGTON/VARIABLE SET 2

Group	SUCCESS		FAILURE		Total
	N	%	N	%	
CONSTRUCTION (N = 747)					
3	414	87.7	58	12.3	472
2	96	84.2	18	15.8	114
1	118	73.3	43	26.7	161
M.C.R. = .199 eta <sup>2</sup> = .0250					
VALIDATION (N = 716)					
3	364	85.4	62	14.6	426
2	98	83.8	19	16.2	117
1	145	83.8	28	16.2	173
M.C.R. = .031 eta <sup>2</sup> = .0003					

TABLE 25  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 ASSOCIATION ANALYSIS  
 CYA/VARIABLE SET 1

Group	SUCCESS		FAILURE		Total
	N	%	N	%	
CONSTRUCTION (N = 776)					
2	87	96.7	3	3.3	90
1	56	93.3	4	6.7	60
4	45	90.0	5	10.0	50
6	68	89.5	8	10.5	76
7	52	86.7	8	13.3	60
10	65	86.7	10	13.3	75
8	57	86.4	9	13.6	66
5	79	84.9	14	15.1	93
3	115	83.9	22	16.1	137
9	57	82.6	12	17.4	69
M.C.R. = .216 eta <sup>2</sup> = .0172					
VALIDATION (N = 467)					
2	62	89.9	7	10.1	69
1	28	93.3	2	6.7	30
4	48	85.7	8	14.3	56
6	41	89.1	5	10.9	46
7	25	78.1	7	21.9	32
10	42	77.8	12	22.2	54
8	27	79.4	7	20.6	34
5	46	82.1	10	17.9	56
3	62	80.5	15	19.5	77
9	35	72.9	13	27.1	48
M.C.R. = .192 eta <sup>2</sup> = .0167					



TABLE 26  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 ASSOCIATION ANALYSIS  
 CYA/VARIABLE SET 2

Group	SUCCESS		FAILURE		Total
	N	%	N	%	
CONSTRUCTION (N = 776)					
3	126	94.7	7	5.3	133
4	75	93.7	5	6.3	80
6	120	90.9	12	9.1	132
1	82	89.1	10	10.9	92
7	76	83.5	15	16.5	91
8	60	81.7	14	18.3	74
5	70	81.4	16	18.6	86
2	74	81.3	17	18.7	91
M.C.R. = .279 eta <sup>2</sup> = .0276					
VALIDATION (N = 467)					
3	78	90.7	8	9.3	86
4	41	80.4	10	19.6	51
6	66	89.2	8	10.8	74
1	52	77.6	15	22.4	67
7	40	80.0	10	20.0	50
8	25	78.1	7	21.9	32
5	43	79.6	11	20.4	54
2	41	77.4	12	22.6	53
M.C.R. = .165 eta <sup>2</sup> = .0101					

TABLE 27  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 ASSOCIATION ANALYSIS  
 VIRGINIA/VARIABLE SET 1

Group	SUCCESS		FAILURE		Total
	N	%	N	%	
CONSTRUCTION (N = 724)					
9	71	95.9	3	4.1	74
2	70	94.6	4	5.4	74
10	66	93.0	5	7.0	71
6	65	92.9	5	7.1	70
4	64	91.4	6	8.6	70
5	53	91.4	5	8.6	58
3	81	91.0	8	9.0	89
1	67	89.3	8	10.7	75
7	74	88.1	10	11.9	84
8	50	84.7	9	15.3	59
M.C.R. = .209 eta <sup>2</sup> = .0112					
VALIDATION (N = 755)					
9	54	93.1	4	6.9	58
2	100	94.3	6	5.7	106
10	77	96.2	3	3.8	80
6	53	86.9	8	13.1	61
4	68	97.1	2	2.9	70
5	57	95.0	3	5.0	60
3	75	82.4	16	17.6	91
1	63	85.1	11	14.9	74
7	81	90.0	9	10.0	90
8	55	84.6	10	15.4	65
M.C.R. = .212 eta <sup>2</sup> = .0087					

TABLE 28  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 ASSOCIATION ANALYSIS  
 VIRGINIA/VARIABLE SET 2

Group	SUCCESS		FAILURE		Total
	N	%	N	%	
CONSTRUCTION (N = 724)					
5	102	95.3	5	4.7	107
3	65	94.2	4	5.8	69
2	176	94.1	11	5.9	187
6	70	92.1	6	7.9	76
7	117	90.0	13	10.0	130
4	89	85.6	15	14.4	104
1	42	82.4	9	17.6	51
M.C.R. = .267 eta <sup>2</sup> = .0201					
VALIDATION (N = 755)					
5	84	94.4	5	5.6	89
3	79	100.0	0	0.0	79
2	202	90.2	22	9.8	224
6	73	94.8	4	5.2	77
7	129	89.6	15	10.4	144
4	80	84.2	15	15.8	95
1	36	76.6	11	23.4	47
M.C.R. = .284 eta <sup>2</sup> = .0238					

TABLE 29  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 ASSOCIATION ANALYSIS  
 WASHINGTON/VARIABLE SET 1

Group	SUCCESS		FAILURE		Total
	N	%	N	%	
CONSTRUCTION (N = 747)					
9	66	88.0	9	12.0	75
10	79	86.8	12	13.2	91
6	45	84.9	8	15.1	53
2	77	84.6	14	15.4	91
1	47	83.9	9	16.1	56
3	51	83.6	10	16.4	61
4	77	82.8	16	17.2	93
7	101	82.1	22	17.9	123
5	41	82.0	9	18.0	50
8	44	81.5	10	18.5	54
M.C.R. = .085 eta <sup>2</sup> = .0031					
VALIDATION (N = 716)					
9	75	90.4	8	9.6	83
10	93	92.1	8	7.9	101
6	37	80.4	9	19.6	46
2	81	82.7	17	17.3	98
1	38	77.6	11	22.4	49
3	50	80.6	12	19.4	62
4	64	84.2	12	15.8	76
7	88	87.1	13	12.9	101
5	38	84.4	7	15.6	45
8	43	78.2	12	21.8	55
M.C.R. = .108 eta <sup>2</sup> = .0063					

TABLE 30  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 ASSOCIATION ANALYSIS  
 WASHINGTON/VARIABLE SET 2

Group	SUCCESS		FAILURE		Total
	N	%	N	%	
CONSTRUCTION (N = 747)					
5	73	92.4	6	7.6	79
7	70	90.9	7	9.1	77
3	73	89.0	9	11.0	82
6	107	86.3	17	13.7	124
4	96	84.2	18	15.8	114
8	51	82.3	11	17.7	62
1	62	78.5	17	21.5	79
2	96	73.8	34	26.2	130
M.C.R. = .257 eta <sup>2</sup> = .0280					
VALIDATION (N = 716)					
5	55	83.3	11	16.7	66
7	58	92.1	5	7.9	63
3	63	87.5	9	12.5	72
6	97	80.8	23	19.2	120
4	98	83.8	19	16.2	117
8	56	84.8	10	15.2	66
1	63	84.0	12	16.0	75
2	117	85.4	20	14.6	137
M.C.R. = .021 eta <sup>2</sup> = .0001					

Burgess Technique

The Burgess predictive technique was developed by Ernst W. Burgess in 1928 (Burgess, 1928) while studying parolees in the Illinois correctional system. He began with the hypothesis that "differences in a number of factors may exist between those who violated parole and those who did not violate among the three thousand subjects whose cases were under study" (Hakeem, 1948). Hence, this approach is based on the simple assignment of points on the basis of association between predictive factors and predictive criterion. Many later techniques (e.g., regression, configural) represent attempts to improve on this method.

Although the Burgess technique has the advantages of simplicity and a potential for good validity, the lack of "weighting" of predictive factors according to relative importance effectively ignores intercorrelations among them, thus reducing the efficiency of prediction.

Predictive factors are in the form of dichotomies and no strenuous assumptions are made concerning level of measurement or distribution. Therefore, the CPDP Burgess analysis drew from the same two variable pools on which the configural analyses were based.

Burgess proceeds by first identifying each factor that is found to be related to the prediction criterion. The relationship between predictors and the criterion is

measured by Chi-square or phi. Again, Chi-square was utilized in the CPDP analysis since N was constant for all bivariate relationships. Tables 31, 32, and 33 present the CPDP variables found to be significantly related ( $p < .05$ ) to parole outcome and included in the Burgess prediction for each of the three agencies studied.

A predictive score for this method is simply the total number of points assigned to an individual. Points are assigned if an individual falls into the category with a success rate which exceeds the expected success rate for the entire population, i.e., the category with greater than 87.8% success for CYA, 91.3% success for Virginia, and 84.1% success for Washington. Therefore, the total predictive score for an individual would be equal to the number of his attributes which are associated with parole outcome.

Separate predictions were made from the significant attributes found within each of the two variable pools.\* The point bi-serial  $r^2$  between Burgess predictive scores and actual parole outcome for construction and validation samples from each agency are displayed in Table 34. Shrinkage between construction and validation is

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\*For CYA, only one prediction was made, since the significant attributes in each variable set were the same.

indicated in the third column of the table. The low percentage of variance explained through the Burgess prediction further suggests the lack of important linear relations in the CPDP data between predictor variables and parole outcome.



TABLE 31

BURGESS B.E. PREDICTOR VARIABLES

CYA

(% Success for Construction Sample = 87.8)

Variable	$\chi^2$ with Parole Outcome*	Category Associated with Parole Success	% Success
Narcotic Offense	4.364	Narcotic Offense	92.8
Prior Non-Prison	6.335	Less than four	90.8
Age at Admission	9.078	Fifth Pentile	95.3

\* $\chi^2$  significant at .05 level

TABLE 32

BURGESS B.E. PREDICTOR VARIABLES  
VIRGINIA

(% Success for Construction Sample = 91.3)

Variable	$\chi^2$ with Parole Outcome*	Category Associated with Parole Success	% Success
VARIABLE SET 1			
Willful Homicide	3.921	Willful Homicide	97.6
Vehicle Theft	4.389	Other Offense	91.8
Prior Prison	5.218	None	93.0
VARIABLE SET 2			
Offense	5.003	Person	94.3
Prior Prison	5.218	None	93.0

\* $\chi^2$  significant at .05 level

TABLE 33  
BURGESS B.E. PREDICTOR VARIABLES  
WASHINGTON  
(% Success for Construction Sample = 84.1)

Variable	$\chi^2$ with Parole Outcome*	Category Associated with Parole Success	% Success
VARIABLE SET 1			
Admission Type = 2	7.304	Other Admission	86.3
Vehicle Theft	4.635	Other Offense	85.3
Forgery/Fraud	5.075	Other Offense	85.2
Prior Prison	7.260	None	87.1
VARIABLE SET 2			
Admission Type	11.972	Other Admission	87.7
Prior Prison	7.260	None	87.1

\* $\chi^2$  significant at .05 level

TABLE 34

## BURGESS: VARIANCE EXPLAINED

Agency	Construction $r^2$	Validation $r^2$	Shrinkage
<u>CYA</u>			
Variable Set #1	.0269	.0237	.0032
<u>Virginia</u>			
Variable Set #1	.0180	.0139	.0041
Variable Set #2	.0144	.0130	.0014
<u>Washington</u>			
Variable Set #1	.0303	.0000	.0303
Variable Set #2	.0207	.0000	.0207

## COMPARISON OF METHODS

To ascertain which of the statistical methods employed in the study provided the best prediction of actual parole success, some measure of predictive power had to be calculated for each of the methods. Furthermore, the measure chosen had to be comparable between methods. These requirements were met with two alternative measures.

The first measure utilized in the CPDP study is the Mean Cost Rating (MCR) developed by Duncan et al. (1953, 1955).<sup>3</sup> It is designed to reflect the extent to which

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<sup>3</sup>MCR is defined by the expression:

$$\text{MCR} = \sum_{i=1}^k c_i u_{i-1} - \sum_{i=1}^k c_{i-1} u_i$$

where:

U (utility) is the proportion of total violators in the sample who could be identified if all cases in categories 1 through i were called violators;

C is the proportion of total non-violators in categories 1 through i; and

k is the number of categories, arranged in order of decreasing violation rate.

(Gough, 1962)

a prediction device has successfully classified individuals as either successes or failures on parole. The MCR is superior to measures such as Chi-square because it is sensitive to changes in order, and therefore may pick up shrinkage or instability which would go undetected by techniques which ignore ordinal properties of the data. However, MCR retains the advantage of requiring no assumptions of normality, continuity, or equality of score units. Thus, MCR "is a very useful instrument for assessing the power of a finished prediction table" (Simon, 1971).

In calculating MCR coefficients, terminal subgroups for the configural techniques were ranked in order of increasing success rate. Regression and Burgess scores were collapsed into categories which conform to an approximately normal distribution (see Tables 36 through 51).

The second comparable measure of predictive power is provided by two statistics which have different data requirements but yield an identical interpretation. Both the Coefficient of Determination ( $R^2$ ) and Correlation Ratio ( $\text{Eta}^2$ ) provide measures of the percentage of variability in a dependent variable which is explained by scores in a predictor variable.  $R^2$ , however, assumes interval measurement and normal distribution of variable

scores. (Point-biserial  $r$ , which allows a dichotomous dependent variable, was calculated and squared to provide the measure of variance explained for the Burgess scores and for the validation of the regression scores.) In the case of regression in the construction sample, point-biserial  $r$  is equivalent to the Multiple Correlation Coefficient ( $R$ ) associated with the regression prediction equation.  $\text{Eta}^2$ , which does not require the above data assumptions, was calculated for the configural techniques.

The  $R^2$  and  $\text{eta}^2$  coefficients on construction represent the degree of relation between predicted success rates for individuals or groups in the construction sample and their recorded parole outcome. Validation coefficients represent the relation of predicted scores for the validation sample (predicted, that is, by the instruments developed on construction) with the actual parole outcome of individuals in the validation sample. Predicted scores for regression, of course, take the form of continuous, real numbers (rounded to integers); for Burgess they are continuous integer scores; and for the configural techniques predicted scores are success rates for the terminal subgroups within which an individual falls. Actual parole outcome would be measured as recorded success or failure of each individual.

Table 35 presents Mean Cost Ratings and  $R^2$  or  $\eta^2$  on construction and validation for those predictive equations which are comparable, i.e., those developed from the same data set. This includes the regression equations which use a dichotomized dependent variable, and equations from configural techniques using Variable Set 1. Although these equations are not the best for each method--the regression equations which use a scaled dependent measure are particularly superior--they are directly comparable whereas the others are not. While the validation coefficients obtained for CYA and Virginia are within the range of other studies, they are at the low end of that range. The techniques displayed no predictive power for the Washington study, each explaining less than one percent of the variance in Parole Outcome for the validation sample. Such results must question the predictive utility of the CPDP data.

Though none of the techniques proved notably successful in predicting Parole Outcome, some comparisons can be made. Given the superior data fitting capabilities of regression analysis, its poor performance in the CPDP study came as somewhat of a surprise. One explanation could be the violation of assumptions of additivity and linearity of relation. However, Predictive Attribute Analysis, which relaxes these assumptions, achieved only



slightly higher validation  $\eta^2$  values in CYA and Virginia, and actually suffered greater shrinkage in Washington. Indeed, the close fitting of predictive techniques to the relations within the construction sample appears to typically result in a drastically reduced predictive ability in the validation sample. Note that the most successful technique for prediction in both the CYA and Virginia validation samples was the unweighted, linear, and additive Burgess technique. This result may suggest the limits of sophisticated data-fitting techniques for improving prediction of future parole performance, at least within the CPDP data.

TABLE 35  
RELATIVE POWER OF PREDICTIVE METHODS

	MEAN COST RATING		$r^2$ or $\eta^2$	
	Construction	Validation	Construction	Validation
<u>CYA</u>				
Regression	.239	.161	.0425	.0064
Burgess	.268	.214	.0269	.0237
Predictive Attribute	.214	.133	.0210	.0095
Association Analysis	.216	.192	.0172	.0167
<u>Virginia</u>				
Regression	.152	.134	.0183	.0092
Burgess	.237	.202	.0180	.0139
Predictive Attribute	.260	.169	.0210	.0102
Association Analysis	.209	.212	.0112	.0087
<u>Washington</u>				
Regression	.268	.056	.0400	.0020
Burgess	.240	-.010	.0303	.0000
Predictive Attribute	.290	.039	.0419	.0008
Association Analysis	.085	.108	.0031	.0063

TABLE 36  
 MULTIPLE REGRESSION: PAROLE EXPECTANCY RATES  
 CYA  
 (Construction)

Score Categories	Success	Failure	Total
0- 5	83 95.4%	4 4.6%	87 11.2%
6- 11	250 90.9%	25 9.1%	275 35.4%
12- 17	226 85.9%	37 14.1%	263 33.9%
18- 23	112 83.0%	23 17.0%	135 17.4%
24- 29	10 76.9%	3 23.1%	13 1.7%
30-100	0 0.0%	3 100.0%	3 0.4%
Total	681 87.8%	95 12.2%	776 100.0%

r = .2061  
 M.C.R. = .239

TABLE 37  
 MULTIPLE REGRESSION: PAROLE EXPECTANCY RATES  
 CYA  
 (Validation)

Score Categories	Success	Failure	Total
0- 5	62 88.6%	8 11.4%	70 15.0%
6- 11	124 84.9%	22 15.1%	146 31.3%
12- 17	132 83.0%	27 17.0%	159 34.0%
18- 23	58 71.6%	23 28.4%	81 17.3%
24- 29	9 90.0%	1 10.0%	10 2.1%
30-100	1 100.0%	0 0.0%	1 0.2%
Total	386 82.7%	81 17.3%	467 100.0%

$r = .0801$   
 $M.C.R. = .161$

TABLE 38  
 MULTIPLE REGRESSION: PAROLE EXPECTANCY RATES  
 VIRGINIA  
 (Construction)

Score Categories	Success	Failure	Total
2	78 97.5%	2 2.5%	80 11.0%
9	550 91.2%	53 8.8%	603 83.3%
16	4 100.0%	0 0.0%	4 0.6%
21	22 81.5%	5 18.5%	27 3.7%
23	7 77.8%	2 22.2%	9 1.2%
25	0 0.0%	1 100.0%	1 0.1%
Total	661 91.3%	63 8.7%	724 100.0%

$r = .1353$   
 M.C.R. = .152



**CONTINUED**

**4 OF 6**

TABLE 39  
 MULTIPLE REGRESSION: PAROLE EXPECTANCY RATES  
 VIRGINIA  
 (Validation)

Score Categories	Success	Failure	Total
2	91 97.8%	2 2.2%	93 12.3%
9	562 89.8%	64 10.2%	626 82.9%
16	3 100.0%	0 0.0%	3 0.4%
21	19 76.0%	6 24.0%	25 3.3%
23	7 100.0%	0 0.0%	7 0.9%
35	1 100.0%	0 0.0%	1 0.1%
Total	683 90.5%	72 9.5%	755 100.0%

$r = .0957$   
 M.C.R. = .134



TABLE 40  
 MULTIPLE REGRESSION: PAROLE EXPECTANCY RATES  
 WASHINGTON  
 (Construction)

Score Categories	Success	Failure	Total
9	322 89.9%	36 10.1%	358 47.9%
19	164 82.4%	35 17.6%	199 26.6%
21	88 81.5%	20 18.5%	108 14.5%
30	48 66.7%	24 33.3%	72 9.6%
36	4 66.7%	2 33.3%	6 0.8%
46	2 50.0%	2 50.0%	4 0.5%
Total	628 84.1%	119 15.9%	747 100.0%

$r = .2001$   
 M.C.R. = .268

TABLE 41  
 MULTIPLE REGRESSION: PAROLE EXPECTANCY RATES  
 WASHINGTON  
 (Validation)

Score Categories	Success	Failure	Total
9	281 85.4%	48 14.6%	329 45.9%
19	180 86.1%	29 13.9%	209 29.2%
21	81 86.2%	13 13.8%	94 13.1%
30	60 76.9%	18 23.1%	78 10.9%
36	2 66.7%	1 33.3%	3 0.4%
46	3 100.0%	0 0.0%	3 0.4%
Total	607 84.8%	109 15.2%	716 100.0%

$r = .0447$   
 M.C.R. = .056

TABLE 42

BURGESS: PAROLE EXPECTANCY RATES  
 CYA - VARIABLE SET 1  
 (Construction)

Score Categories	Success	Failure	Total
3	17 100.0%	0 0.0%	17 2.2%
2	134 95.0%	7 5.0%	141 18.2%
1	334 89.1%	41 10.9%	375 48.3%
0	196 80.7%	47 19.3%	243 31.3%
Total	681 87.8%	95 12.2%	776 100.0%

$r = .164$   
 $M.C.R. = .268$

TABLE 43

BURGESS: PAROLE EXPECTANCY RATES  
 CYA - VARIABLE SET 1  
 (Validation)

Score Categories	Success	Failure	Total
3	9 100.0%	0 0.0%	9 1.9%
2	78 90.7%	8 9.3%	86 18.4%
1	192 83.5%	38 16.5%	230 49.3%
0	107 75.4%	35 24.6%	142 30.4%
Total	386 82.7%	81 17.3%	467 100.0%

$r = .154$   
 $M.C.R. = .214$

TABLE 44  
 BURGESS: PAROLE EXPECTANCY RATES  
 VIRGINIA - VARIABLE SET 1  
 (Construction)

Score Categories	Success	Failure	Total
3	65 97.0%	2 3.0%	67 9.3%
2	406 93.1%	30 6.9%	436 60.2%
1	179 86.5%	28 13.5%	207 28.6%
0	11 78.6%	3 21.4%	14 1.9%
Total	661 91.3%	63 8.7%	724 100.0%

r = .134  
 M.C.R. = .237

TABLE 45

BURGESS: PAROLE EXPECTANCY RATES  
 VIRGINIA - VARIABLE SET 1  
 (Validation)

Score Categories	Success	Failure	Total
3	64 97.0%	2 3.0%	66 8.7%
2	441 91.9%	39 8.1%	480 63.6%
1	171 85.1%	30 14.9%	201 26.6%
0	7 87.5%	1 12.5%	8 1.1%
Total	683 90.5%	72 9.5%	755 100.0%

r = .118  
 M.C.R. = .202

TABLE 46

BURGESS: PAROLE EXPECTANCY RATES  
 WASHINGTON - VARIABLE SET 1  
 (Construction)

Score Categories	Success	Failure	Total
4	269 90.0%	30 10.0%	299 40.0%
3	225 83.3%	45 16.7%	270 36.1%
2	115 78.8%	31 21.2%	146 19.5%
1	19 59.4%	13 40.6%	32 4.3%
Total	628 84.1%	119 15.9%	747 100.0%

$r = .174$   
 M.C.R. = .240

TABLE 47

BURGESS: PAROLE EXPECTANCY RATES  
 WASHINGTON - VARIABLE SET 1  
 (Validation)

Score Categories	Success	Failure	Total
4	228 82.9%	47 17.1%	275 38.4%
3	221 88.4%	29 11.6%	250 34.9%
2	129 83.8%	25 16.2%	154 21.5%
1	29 78.4%	8 21.6%	37 5.2%
Total	607 84.8%	109 15.2%	716 100.0%

$r = .005$   
 $M.C.R. = -.010$



TABLE 48

BURGESS: PAROLE EXPECTANCY RATES  
 VIRGINIA - VARIABLE SET 2  
 (Construction)

Score Categories	Success	Failure	Total
2	209 94.6%	12 5.4%	221 30.5%
1	327 92.1%	28 7.9%	355 49.0%
0	125 84.5%	23 15.5%	148 20.4%
Total	661 91.3%	63 8.7%	724 100.0%

$r = .120$   
 $M.C.R. = .222$

TABLE 49  
 BURGESS: PAROLE EXPECTANCY RATES  
 VIRGINIA - VARIABLE SET 2  
 (Validation)

Score Categories	Success	Failure	Total
2	189 94.0%	12 6.0%	201 26.6%
1	384 91.0%	38 9.0%	422 55.9%
0	110 83.3%	22 16.7%	132 17.5%
Total	683 90.5%	72 9.5%	755 100.0%

r = .114  
 M.C.R. = .197

TABLE 50  
 BURGESS: PAPOLE EXPECTANCY RATES  
 WASHINGTON - VARIABLE SET 2  
 (Construction)

Score Categories	Success	Failure	Total
2	301 88.0%	41 12.0%	342 45.8%
1	209 85.7%	35 14.3%	244 32.7%
0	118 73.3%	43 26.7%	161 21.6%
Total	628 84.1%	119 15.9%	747 100.0%

$r = .144$   
 M.C.R. = .200

TABLE 51  
 BURGESS: PAROLE EXPECTANCY RATES  
 WASHINGTON - VARIABLE SET 2  
 (Validation)

Score Categories	Success	Failure	Total
2	266 84.4%	49 15.6%	315 44.0%
1	196 86.0%	32 14.0%	228 31.8%
0	145 83.8%	28 76.2%	173 24.2%
Total	607 84.8%	109 15.2%	716 100.0%

r = .003

M.C.R. = .002

## VIRGINIA - TWO YEAR PREDICTION

As is evident, our efforts at prediction of parole performance during the first year were something less than successful. It was felt that this was at least partially due to the small number of failures in the samples. In the Virginia data, for instance, the success rate during the first year on parole was 91.3%. This means that simply by predicting that everyone would succeed, we would be correct better than 90% of the time. It would be difficult for any predictive device to improve markedly on this base rate. With this in mind, the analyses were redone using the UPR two year follow-up data for parolees released in Virginia in 1972. This sample gave us approximately twice as large a percentage of failures as the one year data did and, therefore, increased the likelihood that the predictive methods would substantially improve our ability to distinguish high risk individuals.

Virginia 2-Year Regression

Results of the regression analyses using the two year parole outcome were more encouraging than those using the one year. Looking at the construction  $R^2$  (Table 52) it can be seen that for both the dichotomous and scaled criteria, there was a considerable increase in explanatory power. The regression on the scaled dependent variable, in fact, explained slightly more than 7% of the variance. Contrary to the one year results, however, the  $R_C^2$  for the continuous measure shrank more on validation than that for the dichotomy, indicating that the latter would probably be a better predictive instrument.

Interestingly enough, there was very little overlap in the independent variables between the equations for the one year and the equations for the two year outcome. Between the two year equations, on the other hand, the variable lists were very similar; 4 of the 5 variables in the equation for the dichotomy also appear in the other equation.

In both cases prior non-prison sentences appear with a positive sign: increasing #'s of these sentences are indicative of increasing parole risk. Age at admission, time served/pentile 1, and commitment offense of narcotics violation all appear in both equations and all have negative slopes. The fifth variable in the equation for the dichotomy is another commitment offense, forgery/fraud,

and it is associated with greater risk. The final two variables in the equation for the scaled criterion are prior prison sentence and drug use, again both related to poorer parole performance.

While the  $R^2$  for the best of these equations is not overwhelming, it does represent a considerable improvement over either of the one year equations and is, in fact, representative of the best one can normally expect with these data.

TABLE 52  
VIRGINIA, TWO-YEAR OUTCOME

DEPENDENT VARIABLE	VARIABLES SELECTED	SLOPE	BETA	F TO REMOVE	OVERALL F	CONSTRUCTION R <sup>2</sup>	VALIDATION R <sup>2</sup>
Dichotomized Parole Performance	Prior Non-Prison Age at Admission Time Served/ Pentile 1* Forgery/Fraud Narcotic Offense Constant	.01551 -.00061 -.09777  .17666 -.08022 .3384	.12996 -.16680 -.10351  .08918 -.07523	11.73702 19.22431 7.87439  5.96826 4.03509	9.09742	.0595	.0484
Continuously Scaled Parole Performance	Prior Non-Prison Age at Admission Prior Prison Time Served/ Pentile 1* Narcotic Offense Drug Use Constant	.08720 -.00351 .20476 -.44036  -.73637 .41682 1.8449	.13710 -.18060 .09491 -.08745  -.12954 .09407	12.90704 21.31828 6.08273 5.49745  8.50892 4.27846	9.05503	.0703	.0329

\*See Table 4 for pentile definition



### Virginia 2-Year Configural Methods

The configural analyses of the Virginia 2-year data, as was the case with the one-year analyses, were based on two separate variable sets--Variable Set 1, which was the same version as that utilized in the regression analysis; and Variable Set 2, which consists of simple dichotomies of the nine independent variables and the dependent variable. Frequencies and percentages for the variable categories in each variable set are presented in Tables 53 and 54.

TABLE 53  
VARIABLE CATEGORIES FOR CONFIGURAL ANALYSES  
VIRGINIA 2 YEAR

(Variable Set 1)

Variable	Number	Percent
Admission Type = 1		
Other Admission	671	(92.6%)
Admission Type = 1	54	( 7.4%)
Admission Type = 2		
Other Admission	703	(97.0%)
Admission Type = 2	22	( 3.0%)
Admission Type = 3		
Other Admission	696	(96.0%)
Admission Type = 3	29	( 4.0%)
Willful Homicide		
Other Offense	657	(90.6%)
Willful Homicide	68	( 9.4%)
Negligent Manslaughter		
Other Offense	724	(99.9%)
Negligent Manslaughter	1	( 0.1%)
Armed Robbery		
Other Offense	606	(83.6%)
Armed Robbery	119	(16.4%)
Unarmed Robbery		
Other Offense	711	(98.1%)
Unarmed Robbery	14	( 1.9%)
Assault		
Other Offense	655	(90.3%)
Assault	70	( 9.7%)
Burglary		
Other Offense	547	(75.4%)
Burglary	178	(24.6%)
Theft or Larceny		
Other Offense	682	(94.1%)
Theft or Larceny	43	( 5.9%)
Vehicle Theft		
Other Offense	701	(96.7%)
Vehicle Theft	24	( 3.3%)

Variable	Number	Percent
Forgery/Fraud		
Other Offense	696	(96.0%)
Forgery/Fraud	29	( 4.0%)
Other Fraud		
Other Offense	723	(99.7%)
Other Fraud	2	( 0.3%)
Forcible Rape		
Other Offense	708	(97.7%)
Forcible Rape	17	( 2.3%)
Statutory Rape		
Other Offense	713	(98.3%)
Statutory Rape	12	( 1.7%)
Sex Offense/Juvenile		
Other Offense	719	(99.2%)
Sex Offense/Juvenile	6	( 0.8%)
Prostitution		
Other Offense	723	(99.7%)
Prostitution	2	( 0.3%)
Other Sex Offense		
Other Offense	724	(99.9%)
Other Sex Offense	1	( 0.1%)
Narcotic Offense		
Other Offense	611	(84.3%)
Narcotic Offense	114	(15.7%)
Alcohol Offense		
Other Offense	724	(99.9%)
Alcohol Offense	1	( 0.1%)
Sentence Type		
Simple	512	(70.6%)
Multiple	213	(29.4%)
Prior Prison		
None	496	(68.4%)
One or More	229	(31.6%)
Prior Non-Prison/1		
Other	450	(62.1%)
Two to Five	275	(37.9%)

Variable	Number	Percent
Prior Non-Prison/2		
Less Than Six	445	(61.4%)
Six or More	280	(38.6%)
Drug Use		
None or Unknown	492	(67.9%)
Any Use	233	(32.1%)
Alcohol Use		
None or Unknown	351	(48.4%)
Some Involvement	374	(51.6%)
Age at Admission/Pentile 1		
Other Pentile	582	(80.3%)
First Pentile	143	(19.7%)
Age at Admission/Pentile 2		
Other Pentile	586	(80.8%)
Second Pentile	139	(19.2%)
Age at Admission/Pentile 4		
Other Pentile	579	(79.9%)
Fourth Pentile	146	(20.1%)
Age at Admission/Pentile 5		
Other Pentile	568	(78.3%)
Fifth Pentile	157	(21.7%)
Time Served/Pentile 1		
Other Pentile	569	(78.5%)
First Pentile	156	(21.5%)
Time Served/Pentile 2		
Other Pentile	581	(80.1%)
Second Pentile	144	(19.9%)
Time Served/Pentile 4		
Other Pentile	578	(79.7%)
Fourth Pentile	147	(20.3%)
Time Served/Pentile 5		
Other Pentile	592	(81.7%)
Fifth Pentile	133	(18.3%)
Parole Outcome		
Success	591	(81.5%)
Failure	134	(18.5%)

TABLE 54

## VARIABLE CATEGORIES FOR CONFIGURAL ANALYSES

VIRGINIA 2 YEAR

(Variable Set 2)

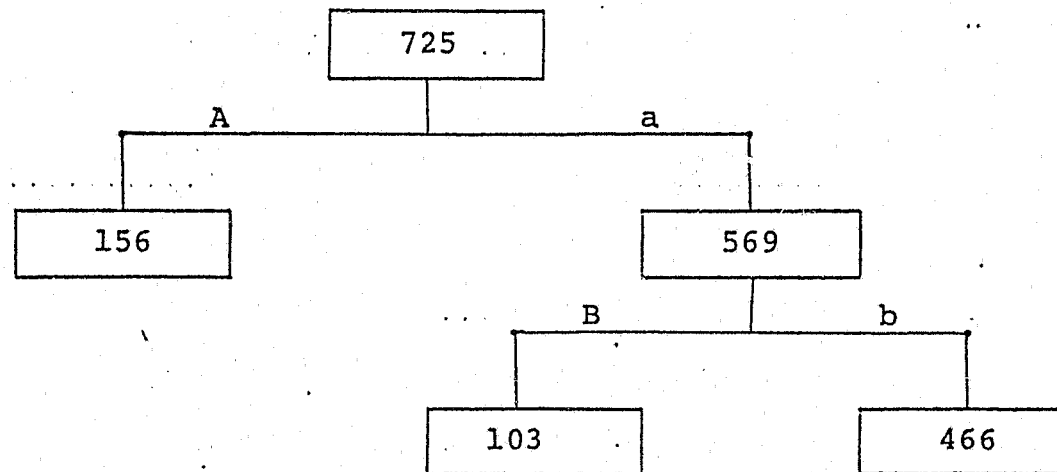
Variable	Number	Percent
Admission Type		
Other Admission	696	(96.0%)
Admission Type = 3	29	( 4.0%)
Offense		
Person	296	(40.8%)
Property	429	(59.2%)
Sentence Type		
Simple	512	(70.6%)
Multiple	213	(29.4%)
Prior Prison		
None	496	(68.4%)
One or More	229	(31.6%)
Prior Non-Prison		
Less than Two	170	(23.4%)
Two or More	555	(76.6%)
Drug Use		
None or Unknown	492	(67.9%)
Any Use	233	(32.1%)
Alcohol Use		
None or Unknown	351	(48.4%)
Some Involvement	374	(51.6%)
Age at Admission		
Other Pentile	443	(61.1%)
1st/2nd Pentile	282	(38.9%)
Time Served		
Other Pentile	425	(58.6%)
1st/2nd Pentile	300	(41.4%)
Parole Outcome		
Success	591	(81.5%)
Failure	134	(18.5%)
.....		

Virginia 2-Year, Predictive Attribute Analysis

When changes in parole outcome after an additional year's follow-up are entered into the Predictive Attribute Analysis, results are altered somewhat. The analysis of Variable Set 1 yielded three terminal subgroups. The primary split came on Time Served/Pentile 1 versus other pentiles; the latter group was further subdivided on Age at Admission/Pentile 2 versus other pentiles. The lowest success rate (70.9%) was attained by parolees whose Time Served was beyond the first pentile and whose Age at Admission falls within the second pentile. The group with the highest success rate, 89.7%, was characterized only by the fact that they have served less time (first pentile of Time Served variable).

The Predictive Attribute Analysis of Variable Set 2 also resulted in three terminal subgroups, with a similar range in success rates--72.4% for those with two or more Prior Non-Prison Sentences and an Age at Admission in the first or second pentile; and 89.4% for individuals with less than two Prior Non-Prison sentences.

PREDICTIVE ATTRIBUTE ANALYSIS  
VIRGINIA 2 YEAR - VARIABLE SET 1



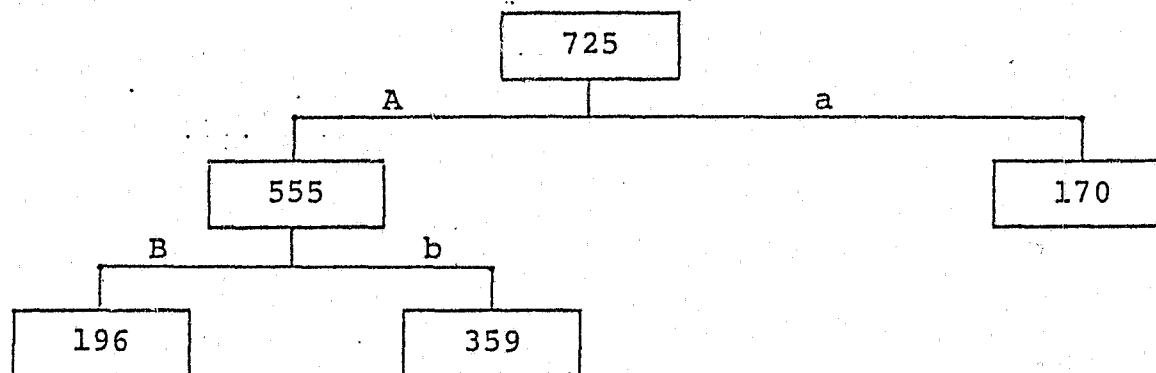
Time Served/Pentile 1  
Age at Admission/Pentile 2

A. First Pentile  
B. Second Pentile

a. Other Pentile  
b. Other Pentile

Figure 7A

PREDICTIVE ATTRIBUTE ANALYSIS  
VIRGINIA 2 YEAR - VARIABLE SET 2



Prior Non-Prison  
Age at Admission

A. Two or More  
B. 1st/2nd Pentile

a. Less than Two  
b. Other Pentile

Figure 7B



TABLE 55  
TERMINAL SUBGROUPS  
PREDICTIVE ATTRIBUTE ANALYSIS  
VIRGINIA 2 YEAR/VARIABLE SET 1

TERMINAL SUBGROUP NUMBER 1

N = 156

Subgroup Characteristics: Time Served/Pentile 1 = First  
Pentile

Success Rate = 89.7%

TERMINAL SUBGROUP NUMBER 2

N = 103

Subgroup Characteristics: Time Served/Pentile 1 = Other  
Pentile  
Age at Admission/Pentile 2 =  
Second Pentile

Success Rate = 70.9%

TERMINAL SUBGROUP NUMBER 3

N = 466

Subgroup Characteristics: Time Served/Pentile 1 = Other  
Pentile  
Age at Admission/Pentile 2 =  
Other Pentile

Success Rate = 81.1%

TABLE 56

TERMINAL SUBGROUPS  
PREDICTIVE ATTRIBUTE ANALYSIS  
VIRGINIA 2 YEAR/VARIABLE SET 2

TERMINAL SUBGROUP NUMBER 1

N = 196

Subgroup Characteristics: Prior Non-Prison = Two or More  
Age at Admission = 1st/2nd  
Pentile

Success Rate = 72.4%

TERMINAL SUBGROUP NUMBER 2

N = 359

Subgroup Characteristics: Prior Non-Prison = Two or More  
Age at Admission = Other  
Pentile

Success Rate = 82.7%

TERMINAL SUBGROUP NUMBER 3

N = 170

Subgroup Characteristics: Prior Non-Prison = Less than  
Two

Success Rate = 89.4%

TABLE 57  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 PREDICTIVE ATTRIBUTE ANALYSIS  
 VIRGINIA 2 YEAR/VARIABLE SET 1

Group	Success N        %		Failure N        %		Total
CONSTRUCTION (N = 725)					
1	140	89.7	16	10.3	156
3	378	81.1	88	18.9	466
2	73	70.9	30	29.1	103
M.C.R. = .180 eta <sup>2</sup> = .020					
VALIDATION (N = 691)					
1	114	89.8	13	10.2	127
3	350	78.1	98	21.9	448
2	90	77.6	26	22.4	116
M.C.R. = .115 eta <sup>2</sup> = .008					

TABLE 58  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 PREDICTIVE ATTRIBUTE ANALYSIS  
 VIRGINIA 2 YEAR/VARIABLE SET 2

Group	Success		Failure		Total
	N	%	N	%	
CONSTRUCTION (N = 725)					
3	152	89.4	18	10.6	170
2	297	82.7	62	17.3	359
1	142	72.4	54	27.6	196
M.C.R. = .214 eta <sup>2</sup> = .0250					
VALIDATION (N = 691)					
3	120	89.6	14	10.4	134
2	288	81.1	67	18.9	355
1	146	72.7	56	27.7	202
M.C.R. = .198 eta <sup>2</sup> = .022					

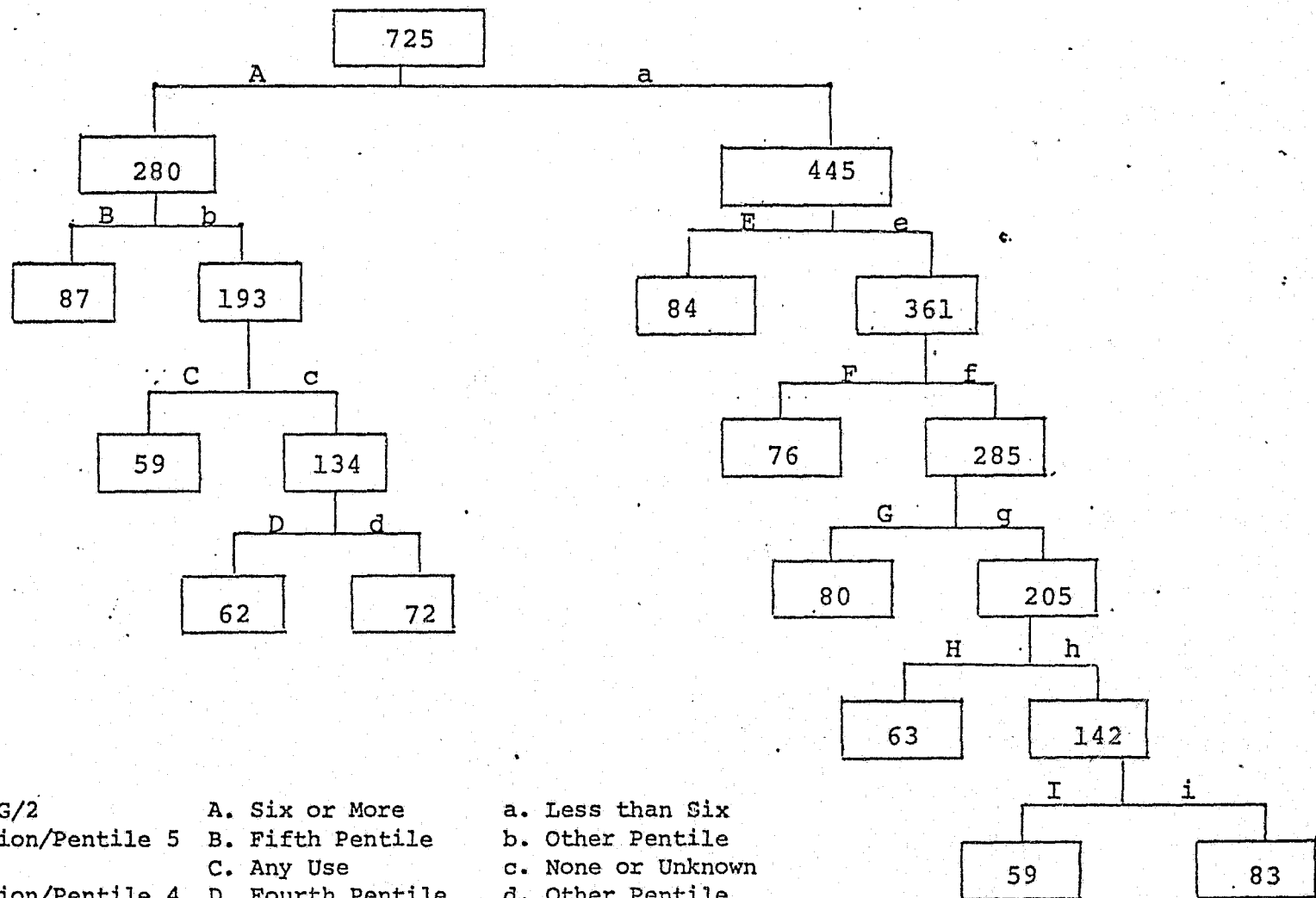
Virginia 2-year, Association Analysis

Consistent with the one-year analysis, the application of the Association Analysis technique to Variable Set 1 of the Virginia 2-year data produced ten terminal subgroups, defined by many of the same independent variables. The least successful subgroup (70.8%) exhibits similar characteristics to the least successful group from the one-year sample--no known history of Drug Use, less than six Prior Non-Prison sentences, and a younger Age at Admission (less than the fourth pentile). The most successful group, with a success rate of 94.0%, is defined by only two variables: less than six Prior Non-Prison sentences and a Narcotic Offense at admission.

As with Variable Set 1, a similar pattern emerged between the one-year and two-year data using Variable Set 2. Seven terminal subgroups were delineated on the basis of four independent variables, three of which were the same as in the one-year analysis. The lowest success rate (75.2%) was demonstrated by the group defined by one or more Prior Prison sentences and a Property Offense, while the most successful group (89.2%) also included those with a Property Offense, but no Prior Prison sentences, no known history of Alcohol Use, and Time Served in the first or second pentile.



ASSOCIATION ANALYSIS  
VIRGINIA 2 YEAR - VARIABLE SET 1



P-N/Prison-VRG/2

Age at Admission/Pentile 5

Drug Use

Age at Admission/Pentile 4

Narcotic Offense

Time Served/Pentile 5

Time Served/Pentile 4

Age at Admission/Pentile 1

Alcohol Use

A. Six or More

B. Fifth Pentile

C. Any Use

D. Fourth Pentile

E. Narcotic Offense

F. Fifth Pentile

G. Fourth Pentile

H. First Pentile

I. Some Involvement

a. Less than Six

b. Other Pentile

c. None or Unknown

d. Other Pentile

e. Other Pentile

f. Other Pentile

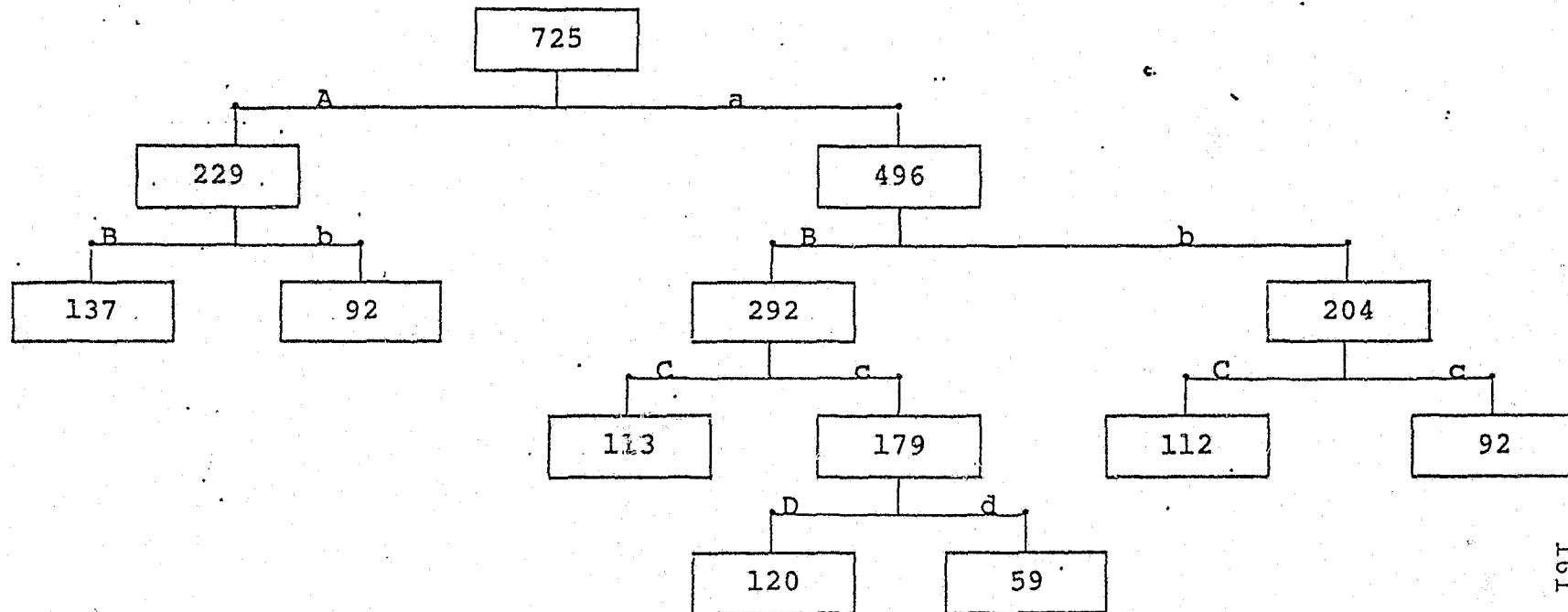
g. Other Pentile

h. Other Pentile

i. None or Unknown

Figure 8A

ASSOCIATION ANALYSIS  
VIRGINIA 2 YEAR - VARIABLE SET 2



Prior Prison  
Offense  
Alcohol Use  
Time Served

A. None  
B. Property  
C. Some Involvement  
D. 1st/2nd Pentile

a. One or More  
b. Person  
c. None or Unknown  
d. Other Pentile

Figure 8B



162  
TABLE 59  
TERMINAL SUBGROUPS  
ASSOCIATION ANALYSIS

VIRGINIA 2 YEAR/VARIABLE SET 1

TERMINAL SUBGROUP NUMBER 1

N = 87

Subgroup Characteristics: Prior Non-Prison = Six or More  
Age at Admission/Pentile 5 =  
Fifth Pentile

Success Rate = 83.9%

TERMINAL SUBGROUP NUMBER 2

N = 59

Subgroup Characteristics: Prior Non-Prison = Six or More  
Age at Admission/Pentile 5 =  
Other Pentile  
Drug Use = Any Use

Success Rate = 74.6%

TERMINAL SUBGROUP NUMBER 3

N = 62

Subgroup Characteristics: Prior Non-Prison = Six or More  
Age at Admission/Pentile 5 =  
Other Pentile  
Drug Use = None or Unknown  
Age at Admission/Pentile 4 =  
Fourth Pentile

Success Rate = 77.4%

TERMINAL SUBGROUP NUMBER 4

N = 72

Subgroup Characteristics: Prior Non-Prison = Six or More  
Age at Admission/Pentile 5 =  
Other Pentile  
Drug Use = None or Unknown  
Age at Admission/Pentile 4 =  
Other Pentile

Success Rate = 70.8%

TERMINAL SUBGROUP NUMBER 5

N = 84

Subgroup Characteristics: Prior Non-Prison = Less than  
Six  
Narcotic Offense = Narcotic  
Offense

Success Rate = 94.0%

TERMINAL SUBGROUP NUMBER 6

N = 76

Subgroup Characteristics: Prior Non-Prison = Less than Six  
 Narcotic Offense = Other Offense  
 Time Served/Pentile 5 = Fifth Pentile

Success Rate = 77.6%

TERMINAL SUBGROUP NUMBER 7

N = 80

Subgroup Characteristics: Prior Non-Prison = Less than Six  
 Narcotic Offense = Other Offense  
 Time Served/Pentile 5 = Other Pentile  
 Time Served/Pentile 4 = Fourth Pentile

Success Rate = 82.5%

TERMINAL SUBGROUP NUMBER 8

N = 63

Subgroup Characteristics: Prior Non-Prison = Less than Six  
 Narcotic Offense = Other Offense  
 Time Served/Pentile 5 = Other Pentile  
 Time Served/Pentile 4 = Other Pentile  
 Age at Admission/Pentile 1 = First Pentile

Success Rate = 73.0%

TERMINAL SUBGROUP NUMBER 9

N = 59

Subgroup Characteristics: Prior Non-Prison = Less than Six  
 Narcotic Offense = Other Offense  
 Time Served/Pentile 5 = Other Pentile  
 Time Served/Pentile 4 = Other Pentile  
 Age at Admission/Pentile 1 = Other Pentile  
 Alcohol Use = Some Involvement

Success Rate = 88.1%

TERMINAL SUBGROUP NUMBER 10

N = 83

Subgroup Characteristics: Prior Non-Prison = Less than  
Six  
Narcotic Offense = Other  
Offense  
Time Served/Pentile 5 = Other  
Pentile  
Time Served/Pentile 4 = Other  
Pentile  
Age at Admission/Pentile 1 =  
Other Pentile  
Alcohol Use = Some Involvement

Success Rate = 88.0%

TABLE 60  
TERMINAL SUBGROUPS  
ASSOCIATION ANALYSIS  
VIRGINIA 2 YEAR/VARIABLE SET 2

TERMINAL SUBGROUP NUMBER 1

N = 137

Subgroup Characteristics: Prior Prison = One or More  
Offense = Property

Success Rate = 75.2%

TERMINAL SUBGROUP NUMBER 2

N = 92

Subgroup Characteristics: Prior Prison = One or More  
Offense = Person

Success Rate = 78.3%

TERMINAL SUBGROUP NUMBER 3

N = 113

Subgroup Characteristics: Prior Prison = None  
Offense = Property  
Alcohol Use = Some Involvement

Success Rate = 77.9%

TERMINAL SUBGROUP NUMBER 4

N = 120

Subgroup Characteristics: Prior Prison = None  
Offense = Property  
Alcohol Use = None or Unknown  
Time Served = 1st/2nd Pentile

Success Rate = 89.2%

TERMINAL SUBGROUP NUMBER 5

N = 59

Subgroup Characteristics: Prior Prison = None  
Offense = Property  
Alcohol Use = None or Unknown  
Time Served = Other Pentile

Success Rate = 78.0%

TERMINAL SUBGROUP NUMBER 6

N = 112

Subgroup Characteristics: Prior Prison = None  
Offense = Person  
Alcohol Use = Some Involvement

Success Rate = 83.0%

TERMINAL SUBGROUP NUMBER 7

N = 92

Subgroup Characteristics: Prior Prison = None  
Offense = Person  
Alcohol Use = None or Unknown

Success Rate = 89.1%

TABLE 61  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 ASSOCIATION ANALYSIS  
 VIRGINIA 2 YEAR/VARIABLE SET 1

Group	Success		Failure		Total
	N	%	N	%	
CONSTRUCTION (N = 725)					
5	79	94.0	5	6.0	84
9	52	88.1	7	11.9	59
10	73	88.0	10	12.0	83
1	73	83.9	14	16.1	87
7	66	82.5	14	17.5	80
6	59	77.6	17	22.4	76
3	48	77.4	14	22.6	62
2	44	74.6	15	25.4	59
8	46	73.0	17	27.0	63
4	51	70.8	21	29.2	72
M.C.R. = .272 eta <sup>2</sup> = .034					
VALIDATION (N = 691)					
5	67	87.0	10	13.0	77
9	63	87.5	9	12.5	72
10	54	83.1	11	16.9	65
1	53	79.1	14	20.9	67
7	46	76.7	14	23.3	60
6	76	83.5	15	16.5	91
3	46	78.0	13	22.0	59
2	52	80.0	13	20.0	65
8	40	80.0	10	20.0	50
4	57	67.1	28	32.9	85
M.C.R. = .170 eta <sup>2</sup> = .012					

TABLE 62  
 SUCCESS RATES FOR TERMINAL SUBGROUPS  
 ASSOCIATION ANALYSIS  
 VIRGINIA 2 YEAR/VARIABLE SET 2

Group	Success		Failure		Total
	N	%	N	%	
CONSTRUCTION (N = 725)					
4	107	89.2	13	10.8	120
7	82	89.1	10	10.9	92
6	93	83.0	19	17.0	112
2	72	78.3	20	21.7	92
5	46	78.0	13	22.0	59
3	88	77.9	25	22.1	113
1	103	75.2	34	24.8	137
M.C.R. = .196 eta <sup>2</sup> = .019					
VALIDATION (N = 691)					
4	95	86.4	15	13.6	110
7	61	85.9	10	14.1	71
6	94	80.3	23	19.7	117
2	78	85.7	13	14.3	91
5	42	77.8	12	22.2	54
3	85	74.6	29	25.4	114
1	99	73.9	35	26.1	134
M.C.R. = .165 eta <sup>2</sup> = .010					

Virginia 2-Year, Burgess

The application of the Burgess technique to the Virginia 2 year data produced a marked improvement upon the results obtained with the one year data. The two year analysis yielded several more significant variables which could be included in the Burgess prediction (see Table 63).

The variance explained with the Burgess analysis is indicated below in Table 63a.

TABLE 63a.  
BURGESS: VARIANCE EXPLAINED

	Construction $r^2$	Validation $r^2$	Shrinkage
<u>Virginia 2 Year</u>			
Variable Set 1	.0335	.0246	.0089
Variable Set 2	.0372	.0213	.0159

A point bi-serial  $r^2$  of .0335 on construction and .0246 on validation was achieved with Variable Set 1, while the variance explained with Variable Set 2 was .0372 on construction and .0213 on validation. A review of Table 34 provides a comparison with the one year results for Virginia, highlighting the increased predictive power of the two year model.



TABLE 63  
BURGESS B.E. PREDICTOR VARIABLES  
VIRGINIA 2 YEAR

(% Success for Construction Sample = 81.5)

Variable	$\chi^2$ with Parole Outcome*	Category Associated with Parole Success	% Success
VARIABLE SET 1			
Willful Homicide	3.966	Willful Homicide	91.2
Forgery/Fraud	6.299	Other	82.3
Narcotic Offense	5.074	Narcotic Offense	89.5
Prior Prison	5.290	None	83.9
Prior Non- Prison	5.330	Less than Six	84.3
Time Served/ Pentile 1	8.246	First Pentile	89.7
VARIABLE SET 2			
Prior Prison	5.290	None	83.9
Prior Non- Prison	8.514	Less than Two	89.4
Age at Admission	6.894	Other	84.7
Time Served	7.343	1st/2nd Pentile	86.3

$\chi^2$  significant at .05 level

TABLE 64  
RELATIVE POWER OF PREDICTIVE METHODS  
VIRGINIA 2 YEAR

	Mean Cost Rating		$r^2$ or $\eta^2$	
	Construction	Validation	Construction	Validation
<u>Virginia 2 Year</u>				
Regression	.307	.303	.0595	.0484
Burgess	.257	.217	.0335	.0246
Predictive Attribute	.180	.115	.020	.008
Association Analysis	.272	.170	.034	.012

## VIRGINIA 2-YEAR, COMPARISON OF METHODS

Table 64 illustrates a comparison of the four predictive methods applied to the Virginia 2 year data. The same criteria were applied here as with the one year comparison, that is, the consideration of those models which were directly comparable but not necessarily the most predictive; and the use of Mean Cost Rating,  $r^2$  and/or  $\eta^2$  as measures of predictive power.

The regression analysis proved most effective for predicting parole outcome with the two-year data, achieving substantial improvement upon the results obtained in the one-year analysis. On the other hand, the predictive power demonstrated by the Predictive Attribute Analysis of the one-year data suffered markedly here in comparison with the other three techniques. Whether this finding is due solely to the increase in the failure rate evident for the 2 year sample cannot be determined from available evidence. It is noteworthy, however, that with the exception of Predictive Attribute Analysis every method employed was more accurate (as measured by the validation coefficients) when applied to the 2 year sample. It seems likely, although not certain, that the anomalous behavior of the predictive attribute technique is due to its extreme tendency towards sample overfitting.

TABLE 65  
 REGRESSION: PAROLE EXPECTANCY RATES  
 VIRGINIA - 2 YEAR  
 (Construction)

Score Categories	Success	Failure	Total
<-9	4 100.0%	0 0.0%	4 0.5%
-9- 0	19 100.0%	0 0.0%	19 2.6%
.1-10	108 94.7%	6 5.3%	114 15.7%
11-20	227 83.2%	46 16.8%	273 37.7%
21-30	202 76.5%	62 23.5%	264 36.4%
31-40	27 67.5%	13 32.5%	40 5.5%
>40	4 36.4%	7 63.6%	11 1.5%
Total	591 81.5%	134 18.5%	725 100.0%

$r = .244$   
 $M.C.R. = .307$

TABLE 66  
 REGRESSION: PAROLE EXPECTANCY RATES  
 VIRGINIA - 2 YEAR  
 (Validation)

Score Categories	Success	Failure	Total
<-9	4 100.0%	0 0.0%	4 0.6%
-9- 0	16 88.9%	2 11.1%	18 2.6%
1-10	94 93.1%	7 6.9%	101 14.7%
11-20	195 85.5%	33 14.5%	228 33.1%
21-30	197 73.8%	70 26.2%	267 38.8%
31-40	42 66.7%	21 33.3%	63 9.2%
>40	4 50.0%	4 50.0%	8 1.2%
Total	552 80.1%	137 19.9%	689 100.0%

$r = .220$   
 M.C.R. = .303

TABLE 67

BURGESS: PAROLE EXPECTANCY RATES  
 VIRGINIA 2 YEAR - VARIABLE SET 1  
 (Construction)

Score Categories	Success	Failure	Total
5	38 100.0%	0 0.0%	38 5.2%
4	132 90.4%	14 9.6%	146 20.1%
3	194 81.2%	45 18.8%	239 33.0%
2	147 76.6%	45 23.4%	192 26.5%
1	74 74.0%	26 26.0%	100 13.8%
0	6 60.0%	4 40.0%	10 1.4%
Total	591 81.5%	134 18.5%	725 100.0%

$r = .183$   
 $M.C.R. = .257$

TABLE 68  
 BURGESS: PAROLE EXPECTANCY RATES  
 VIRGINIA 2 YEAR - VARIABLE SET 1  
 (Validation)

Score Categories	Success	Failure	Total
5	33 97.1%	1 2.9%	34 4.9%
4	115 85.2%	20 14.8%	135 19.5%
3	187 83.9%	36 16.1%	223 32.3%
2	133 73.5%	48 26.5%	181 26.2%
1	84 73.7%	30 26.3%	114 16.5%
0	2 50.0%	2 50.0%	4 0.6%
Total	554 80.2%	137 19.8%	691 100.0%

$r = .157$   
 M.C.R. = .217

TABLE 69  
BURGESS: PAROLE EXPECTANCY RATES  
VIRGINIA 2 YEAR - VARIABLE SET 2  
(Construction)

Score Categories	Success	Failure	Total
4	40 97.6%	1 2.4%	41 5.7%
3	154 88.5%	20 11.5%	174 24.0%
2	205 83.0%	42 17.0%	247 34.1%
1	170 74.2%	59 25.8%	229 31.6%
0	22 64.7%	12 35.3%	34 4.7%
Total	591 81.5%	134 18.5%	725 100.0%

$r = .193$   
M.C.R. = .271



TABLE 70  
BURGESS: PAROLE EXPECTANCY RATES  
VIRGINIA 2 YEAR - VARIABLE SET 2  
(Validation)

Score Categories	Success	Failure	Total
4	18 81.8%	4 18.2%	22 3.2%
3	124 89.9%	14 10.1%	138 20.0%
2	222 81.0%	52 19.0%	274 39.7%
1	167 75.9%	53 24.1%	220 31.8%
0	23 62.2%	14 37.8%	37 5.4%
Total	554 80.2%	137 19.8%	691 100.0%

$r = .146$   
M.C.R. = .202

The Washington B.E. Study

In addition to the UPR data base discussed above, a second set of data was analyzed as part of the CPDP Study. These data, provided by the State of Washington Department of Social and Health Services, consist of three separate study samples of Washington parolees. Group 1 (N = 662) includes persons paroled between July 1, 1968 and June 30, 1969 who had odd serial numbers; Group 2 (N = 592) includes persons paroled during the same time period, but who had even serial numbers; and Group 3 (N = 596) includes persons paroled after June 30, 1969. Group 1 served as a construction sample for regression, configural, and Burgess analyses, the results of which were subsequently validated on Groups 2 and 3.

For the purposes of the present study, the original set of some 175 variables which comprise the data was reduced to approximately 72. In the process of selecting variables for the CPDP analysis, only those items that would be available for a first Board Hearing were considered, thus eliminating many variables from the pool. In addition, a substantial number of variables were excluded because they had more than 20% missing data, a level at which, it was surmised, the contribution of the variable would not be meaningful. The definitions of these 72 remaining variables are presented in Table 71. For these variables, missing data were handled in the following

manner: (1) for variables with 10%-20% missing, a "dummy" variable was created (with a value of "1" if the variable had a missing value, otherwise with a value of "0");

2) for variables with less than 10% missing, the missing cases were recoded to the mean value of the variable;

3) for categorized or attribute data, missing cases were rescaled to the modal category for this item. All variables were dichotomized for use in the configural and Burgess analyses (see Table 72). For the regression analysis, the same dichotomous categories were used for attributes, and continuous variables were retained as coded. In addition, several "dummy" variables were created for the regression analysis for each category of the Offense variable.

TABLE 71

## WASHINGTON DEPARTMENT OF SOCIAL AND HEALTH SERVICES VARIABLES

True Name Different Than Name Under Which Committed (Adm. Sum.)

- 1 No
- 2 Yes

Number of Aliases (Adm. Sum.)

- 0 None
- 1 - 8
- 9 Nine or more

Birthdate (Adm. Sum.)

- 00 - 99 Year of birth
- 01 - 12 Month of birth
- 01 - 31 Day of birth

Race (Adm. Sum.)

- 1 Caucasian
- 2 Negro
- 3 American Indian
- 4 Mexican
- 5 Chinese
- 6 Japanese
- 7 Fillipino
- 8 Other, specify \_\_\_\_\_

Marital Status (Adm. Sum. - Narrative)

- 01 Single
- 02 Married - for first time
- 03 Married - 2 or more times
- 04 Separated - for first time
- 05 Separated - 1 or more previous marriage
- 06 Divorced - for first time
- 07 Divorced - 2 or more times
- 08 Widower - for first time
- 09 Widower - 2 or more times
- 10 Common-law relationship - no prior legal relationships
- 11 Common-law relationship - 1 or more prior legal relationships
- 12 Other, specify \_\_\_\_\_

Religious Preference (Adm. Sum.)

- 0 None
- 1 Catholic
- 2 Jewish
- 3 Mormon
- 4 Protestant
- 5 Other, specify \_\_\_\_\_

Date of Admission to Confinement From Which Paroled  
(Adm. Sum.)

- 00 - 99 Year of admission
- 01 - 12 Month of admission
- 01 - 31 Day of admission

Type of Admission (Adm. Sum.)

- 1 First admission to any adult correctional institution
- 2 Returned on new commitment
- 3 Returned from parole on felony violation; no prosecution
- 4 Returned from parole on misdemeanor violation
- 5 Returned from parole on technical violation

Type of Commitment

- 0 From out-of-state or return from parole
- 1 Standard
- 2 Habitual criminal
- 3 Criminally insane
- 4 Sexual psychopath
- 5 Psychopathic delinquent
- 6 Life
- 7 Execution
- 8 Protective custody (emergency detention)

UPR Offense Code (Adm. Sum.)

- 01 Willful homicide
- 02 Negligent manslaughter
- 10 Armed robbery
- 11 Unarmed robbery
- 20 Aggravated assault
- 30 Burglary
- 40 Theft or larceny, except vehicle
- 50 Vehicle theft
- 60 Forgery, fraud, or larceny by check
- 61 Other fraud
- 70 Rape, forcible
- 71 Rape, statutory
- 72 Sex offenses against juveniles (excluding rape)
- 73 Prostitution or pandering
- 74 All other sex offenses not against juveniles

UPR Offense Code (Adm. Sum.) (continued)

- 80 Violations of alcohol laws
- 85 Possession of heroin, opium, morphine or their natural and synthetic derivatives
- 86 Obtaining heroin, opium, morphine or their natural and synthetic derivatives by fraud or by forged prescription
- 87 Sale of heroin, opium, morphine or their natural and synthetic derivatives
- 88 Distributing heroin, opium, morphine or their natural and synthetic derivatives to minors
- 89 Possession of LSD, mescaline, peyote or related hallucinogenics
- 90 Sale of LSD, mescaline, peyote or related hallucinogenics
- 91 Distributing LSD, mescaline, peyote or related hallucinogenics to minors
- 92 Possession of amphetamines or barbiturates
- 93 Obtaining amphetamines or barbiturates by fraud or by forged prescription
- 94 Sale of amphetamines or barbiturates
- 95 Distributing amphetamines or barbiturates to minors
- 96 Possession of marijuana
- 97 Sale of marijuana
- 98 Distributing marijuana to minors
- 99 All others, specify \_\_\_\_\_

Type of Sentence

- 1 Simple
- 2 Multiple (concurrent)
- 3 Multiple (consecutive)

Establishment of Guilt (Adm. Sum.; Commitment Papers)

- 1 Pled guilty
- 2 Court trial
- 3 Jury trial

Weapons Involved in Offense (Adm. Sum.)

- 1 No
- 2 Yes

Force Involved in Offense (Adm. Sum.)

- 1 No
- 2 Yes

Alcohol Involved in Current Offense or Parole Violation (Adm. Sum.)

- 1 No
- 2 Yes

Drugs Involved in Current Offense or Parole Violation  
(Adm. Sum.)

- 1 No
- 2 Yes

Maximum Sentence Set by Law (Adm. Sum.)

- 00 - 96 (years)
- 97 Life
- 98 Execution
- 99 Until discharge by law, no minimum, no maximum

Minimum Sentence Recommended by Judge (Adm. Sum.)

- 000 - 996 (months)
- 997 Life
- 998 Execution
- ZZZ None Recommended

Minimum Sentence Recommended by Prosecuting Attorney  
(Adm. Sum.)

- 000 - 996 (months)
- 997 Life
- 998 Execution
- ZZZ None Recommended

Reason for First Adult Arrest (FBI Rap Sheet)

- 1 Person offense (murder, manslaughter, rape, indecent liberties, robbery, assault, etc.)
- 2 Property offense (larceny, burglary, auto theft, forgery, etc.)
- 3 Other felonies (arson, non-support) specify
- 4 Misdemeanor offense

Known Number of Adult Arrests Prior to the Present Confinement (FBI Rap Sheet)

- 00 None
- 01 - 99

Age at First Apprehension for Juvenile Delinquency (Adm. Sum.)

- 00 None
- 01 - 99

Age at First Commitment to Juvenile Institution (Adm. Sum. - Narrative)

- 00 None
- 01 - 99

Age at First Arrest For Adult Delinquency (FBI Rap Sheet)

- 00 None
- 01 - 99

Prior Probations (Adm. Sum.)

- 1 No
- 2 Yes, not on probation at time of commitment
- 3 Yes, on probation at time of commitment

Age at First Commitment to Adult Institution (FBI Rap Sheet)

- 00 None
- 01 - 99

Known Number of Prior Court Commitments to Washington Adult Correctional Institutions (Reformatories or Prisons, or Jails for one year or more) (Adm. Sum./FBI Rap Sheet)

- 0 None
- 1 - 8
- 9 Nine or more

Known Number of Prior Admissions to Washington Adult Correctional Institutions (Reformatories or Prisons, or Jails for one year or more) (Adm. Sum./FBI Rap Sheet)

- 0 None
- 1 - 8
- 9 Nine or more

Known Number of Prior Admissions to Any Adult Correctional Institution (Reformatories or Prisons, or jails for one year or more) (Adm. Sum./FBI Rap Sheet)

- 0 None
- 1 - 8
- 9 Nine or more

Prior Adult Sentences in Washington - Excluding Prison and Reformatory (Including Fines, Probations, and Jail Sentences of less than one Year) (Adm. Sum./FBI Rap Sheet)

- 1 No
- 2 Yes

Prior Adult Sentences - Excluding Prison and Reformatory (Including Fines, Probations, and Jail sentences of less than one year) (Adm. Sum./FBI Rap Sheet)

- 1 No
- 2 Yes

Prior Escape Record From Adult Correctional Inst. (Adm. Sum.)

- 0 None
- 1 Washington adult corrections
- 2 Other states adult correction
- 3 Washington and other states adult correction

Number of Prior Parole Violation Returns to Prison While Serving the Present Commitment Offense (Movement Sheet)

- 0 None
- 1 - 8
- 9 Nine or more



Number of Felony Violations Last Period of Community Supervision  
(Adm. Sum./PO Violation Rpt.)

- 0 None
- 1 - 8
- 9 Nine or more

Nature of Felony Violation for Which Returned  
(Adm. Sum./PO Violation Rpt.)

- 00 None
- See UPR Offense codes for remaining codes

Number of Misdemeanor Violations Last Period of Community Supervision (Adm. Sum./PO Violation Rpt.)

- 0 None
- 1 - 8
- 9 Nine or more

Nature of Misdemeanor Violation for Which Returned  
(Adm. Sum./PO Violation Report)

- 0 None
- 1 Drinking offense
- 2 Traffic Offense
- 3 Minor adult
- 4 Contributing to delinquency of a minor
- 5 Petty larceny
- 6 Vagrancy
- 7 Other misdemeanor or gross misdemeanor act, specify \_\_\_\_\_

Number of Technical (Rule) Violations Last Period of Community Supervision (Adm. Sum./PO Violation Rpt.)

- 0 None
- 1 - 8
- 9 Nine or more

Nature of Technical Violation for Which Returned  
(Adm. Sum./PO Violation Rpt.)

- 0 None
- 1 Absconding - failure to report
- 2 Failure to obtain permission to change employment, to leave the county of residence, marry, purchase or operate an automobile, or execute an installment contract
- 3 Association
- 4 Excessive consumption of alcoholic beverage
- 5 Failure to live as a good citizen
- 6 Failure to abide by special conditions

Number of Dependents at Time of Arrest or at Time of PO Warrant (Adm. Sum./Narrative)

- 0 None
- 1 - 8
- 9 Nine or more

On Public Assistance at Time of Arrest or at Time of  
PO Warrant (Adm. Sum./Narrative)

- 1 No
- 2 Yes

Number of Dependents on Public Assistance at Time of  
Arrest or at Time of PO Warrant (Adm. Sum. - Narrative)

- 0 None
- 1 - 8
- 9 Nine or more

Number of Dependents Now on Public Assistance Due  
to Incarceration (Adm. Sum.)

- 0 None
- 1 - 8
- 9 Nine or more

Highest School Grade Completed (Adm. Sum.)

- 00 None
- 51 Ungraded Elementary School
- 52 Ungraded Junior High School
- 53 Ungraded High School
- 01 1st Grade
- 02 2nd Grade
- 03 3rd Grade
- 04 4th Grade
- 05 5th Grade
- 06 6th Grade
- 07 7th Grade
- 08 8th Grade
- 09 9th Grade
- 10 10th Grade
- 11 11th Grade
- 12 High School Graduate
- 13 G.E.D. equivalency
- 14 1st Year College
- 15 2nd Year College
- 16 3rd Year College
- 17 4 or more Years of College - No Degree
- 18 Bachelor's Degree
- 19 Graduate Work
- 20 Graduate Degree

Number of Months of Vocational Training Completed  
(Adm. Sum. - Narrative)

- 00 None
- 01 - 99

Type of Vocational Training (Adm. Sum./Narrative)

- 00 None
- 01 Building Trades
- 02 Machine and Equipment
- 03 Auto Mechanics
- 04 Body and Fender
- 05 Machine Shop
- 06 Welding, Sheetmetal
- 07 Electronics (radio, T.V.)
- 08 Food Service
- 09 Drafting
- 10 Personal Service
- 11 Commercial
- 12 Other, specify \_\_\_\_\_

Employment Last Two Years Prior to Confinement (Adm. Sum./Narrative)

- 1 Employed continuously
- 2 Employed seasonally
- 3 Employed intermittently
- 4 Unemployed majority of time
- 5 Primary activity as a student
- 6 In armed forces
- 7 Primarily confined to institution

Longest Length of Time in Any Job in Past Two Years (in months) (Adm. Sum./Narrative)

- 00 Held no job
- 01 - 99

Problem in Keeping Job (Adm. Sum.)

- 1 None
- 2 Limited employment opportunities
- 3 Skilled only in seasonal work
- 4 Lack of training or experience
- 5 Physical handicaps
- 6 Personality problems
- 7 Absenteeism due to alcoholism
- 8 Absenteeism
- 9 Other problems, specify \_\_\_\_\_

Problems with Alcohol (Adm. Sum.)

- 1 No
- 2 Yes

History of Use of Heroin, Opium, Morphine, or Their Natural and Synthetic Derivatives (Adm. Sum./Narrative)

- 1 No
- 2 Yes

History of Use of Drugs Other Heroin, Opium, Morphine,  
Etc. (Adm. Sum./Narrative)

- 1 No
- 2 Yes

Psychiatric Treatment Recommended (Adm. Sum.)

- 1 No
- 2 Yes

Counseling Treatment Recommended (Adm. Sum.)

- 0 None
- 1 Group
- 2 Individual
- 3 Both

AA or NA Activity Recommendations (Adm. Sum.)

- 0 None
- 1 Alcoholics Anonymous
- 2 Narcotics Anonymous
- 3 Both

Institution Recommended (Adm. Sum.)

- 261 State Penitentiary
- 262 State Reformatory
- 263 Washington Corrections Center - Reception
- 264 Okanogan Honor Camp
- 265 Larch Mountain Honor Camp
- 266 Clallam Bay Honor Camp
- 267 Washougal Honor Camp
- 268 Washington Corrections Center - Institution
- 269 Clearwater Honor Camp

Institution to Which Assigned (Transfer Sheet)

- 261 Washington State Penitentiary
- 262 Washington State Reformatory
- 263 Washington Corrections Center - Reception
- 264 Okanogan Honor Camp
- 265 Larch Mountain Honor Camp
- 266 Clallam Bay Honor Camp
- 267 Washougal Honor Camp
- 268 Washington Corrections Center
- 269 Clearwater Honor Camp

Did Resident Receive One or More Institutional Transfers  
During the Present Confinement (Inst. Progress Rpt.)

- 1 No
- 2 Yes

Number of Prosecutable Rule Infractions Which Resident  
Committed During Present Confinement (Rule Infrac. Rpt.)

- 0 None
- 1 - 8
- 9 Nine or more

Number of Non-Prosecutable Rule Infractions Which Resident  
Committed During Present Confinement (Rule Infractions Rpt.)

- 00 None
- 01 - 99

Number of Completed Escapes During Present Confinement  
(Rule Infraction Rpt.)

- 0 None
- 1 - 8
- 9 Nine or more

Work or Training Release Program (Work Release Rpt.)

- 1 No
- 2 Yes

Parole Plan (Pre-Parole Inv. Rpt.)

- 00 No residence, no employment
- 01 Residence only
- 02 Employment only
- 03 Tentative employment
- 04 Maintenance
- 05 Residence and employment
- 06 Residence and tentative employment
- 07 Other, specify \_\_\_\_\_

With Whom Will Resident Live? (Pre-Parole Inv. Rpt.)

- 1 Will live alone
- 2 Will live with wife
- 3 Will live with wife and children
- 4 Will live with parent(s)
- 5 Will live in parental household with wife (or  
with wife and children)
- 6 Will live with other relative(s)
- 7 Will live with friend(s)
- 8 Will live in facility sponsored by social agency
- 9 Other, specify \_\_\_\_\_

Marital Status at Time of Parole (Inst. Prog. Rpt.)

- 0 No change from marital status at admission for  
present confinement
- 1 Married
- 2 Separated
- 3 Divorced
- 4 Widowed

Outside Agency Support (Pre-Parole Inv. Rpt.)

- 0 None
- 1 Vocational Rehabilitation
- 2 Public Assistance
- 3 Other, specify \_\_\_\_\_

Date of Parole (Inst. Discharge Sheet)

- 00 - 99 Year of parole
- 01 - 12 Month of parole
- 01 - 31 Day of parole

Institution From Which Paroled (Inst. Discharge Sheet)

- 261 Washington State Penitentiary
- 262 Washington State Reformatory
- 263 Washington Corrections Center - Reception
- 264 Okanogan Honor Camp
- 265 Larch Mountain Honor Camp
- 266 Clallam Bay Honor Camp
- 267 Washougal Honor Camp
- 268 Washington Corrections Center - Institution
- 269 Clearwater Honor Camp

UPR Performance Criterion

See Appendix G

Number of Days Until First Arrest While on Parole Supervision

- 000 Not Arrested
- 001- 999

Arrested During Follow-Up Period?

- 1 No
- 2 Yes

TABLE 72  
VARIABLE CATEGORIES FOR CONFIGURAL ANALYSES  
WASHINGTON/B.E. STUDY

Variable	Number	Percent
TRUE NAME?		
No	636	(96.1%)
Yes	26	( 3.9%)
# OF ALIASES		
None	514	(77.6%)
One or More	148	(22.4%)
RACE		
White	527	(79.6%)
Non-White	135	(20.4%)
MARITAL STATUS		
Single	287	(43.4%)
Other	375	(56.6%)
RELIGION		
None/Catholic	204	(30.8%)
Other	458	(69.2%)
ADMISSION TYPE		
First Admission	337	(50.9%)
Other	325	(49.1%)
COMMITMENT TYPE		
Out of State/Return	266	(40.2%)
Other	396	(59.8%)
OFFENSE		
Person	149	(22.5%)
Property	513	(77.5%)
SENTENCE TYPE		
Simple	599	(90.5%)
Multiple	63	( 9.5%)
ESTABLISHMENT OF GUILT		
Plead Guilty	567	(85.6%)
Trial	95	(14.4%)
WEAPONS INVOLVED?		
No	570	(86.1%)
Yes	92	(13.9%)

Variable	Number	Percent
FORCE INVOLVED?		
No	574	(86.7%)
Yes	88	(13.3%)
ALCOHOL INVOLVED?		
No	325	(49.1%)
Yes	337	(50.9%)
DRUGS INVOLVED?		
No	626	(94.6%)
Yes	36	( 5.4%)
MAXIMUM SENTENCE		
15 Years or Less	429	(64.8%)
More than 15 Years	233	(35.2%)
MINIMUM SENTENCE/JUDGE		
36 Months or Less	386	(58.3%)
More than 36 Months	276	(41.7%)
MINIMUM SENTENCE/PROSECUTING ATTORNEY		
36 Months or Less	330	(49.8%)
More than 36 Months	332	(50.2%)
1ST ADULT ARREST = 2		
Other	316	(47.7%)
Property	346	(52.3%)
1ST ADULT ARREST = 3		
Other	650	(98.2%)
Other Felonies	12	( 1.8%)
1ST ADULT ARREST = 4		
Other	416	(62.8%)
Misdemeanor	246	(37.2%)
PRIOR ARRESTS		
Five or Less	312	(47.1%)
More than Five	350	(52.9%)
AGE/1ST JUVENILE APPREHENSION		
None	238	(36.0%)
Other	424	(64.0%)
AGE/1ST JUVENILE COMMITMENT		
None	429	(64.8%)
Other	233	(35.2%)



Variable .....	Number	Percent
AGE/1ST ADULT ARREST		
18 or Less	358	(54.1%)
More than 18	304	(45.9%)
PRIOR PROBATIONS		
No Probations	432	(65.3%)
On Probation	230	(34.7%)
AGE/1ST ADULT COMMITMENT		
20 or Less	313	(47.3%)
More than 20	349	(52.7%)
# PRIOR WASHINGTON COMMITMENTS		
None	522	(78.9%)
One or More	140	(21.1%)
# PRIOR COMMITMENTS		
None	412	(62.2%)
One or More	250	(37.8%)
# PRIOR WASHINGTON ADMISSIONS		
None	395	(59.7%)
One or More	267	(40.3%)
# PRIOR ADMISSIONS		
None	314	(47.4%)
One or More	348	(52.6%)
PRIOR WASHINGTON SENTENCES?		
No	196	(29.6%)
Yes	466	(70.4%)
PRIOR SENTENCES?		
No	395	(59.7%)
Yes	267	(40.3%)
PRIOR ESCAPE RECORD		
None	603	(91.1%)
Other	59	( 8.9%)
# PRIOR VIOLATION RETURNS		
None	587	(88.7%)
One or More	75	(11.3%)
# FELONY VIOLATIONS		
None	458	(69.2%)
One or More	204	(30.8%)

Variable	Number	Percent
FELONY VIOLATION		
None/Person	496	(74.9%)
Property	166	(25.1%)
# MISDEMEANOR VIOLATIONS		
None	589	(89.0%)
One or More	73	(11.0%)
MISDEMEANOR VIOLATIONS		
None	627	(94.7%)
Other	35	( 5.3%)
# TECHNICAL VIOLATIONS		
None	477	(72.1%)
One or More	185	(27.9%)
TECHNICAL VIOLATION		
None	634	(95.8%)
Other	28	( 4.2%)
# DEPENDENTS AT ARREST		
None	416	(62.8%)
One or More	246	(37.2%)
PUBLIC ASSISTANCE AT ARREST?		
No	626	(94.6%)
Yes	36	( 5.4%)
# DEPENDENTS ON PUBLIC ASSISTANCE AT ARREST		
None	613	(92.6%)
One or More	49	( 7.4%)
# DEPENDENTS NOW ON PUBLIC ASSISTANCE		
None	493	(74.5%)
One or More	169	(25.5%)
GRADE COMPLETED		
Through 9th Grade	372	(56.2%)
Beyond 9th Grade	290	(43.8%)
# MONTHS VOCATIONAL TRAINING		
None	496	(74.9%)
One or More	166	(25.1%)
TYPE VOCATIONAL TRAINING		
None	501	(75.7%)
Other	161	(24.3%)

Variable .....	Number	Percent
EMPLOYMENT/LAST 2 YEARS		
Other	427	(64.5%)
Unemployed/Institutionalized	235	(35.5%)
PROBLEM KEEPING JOB		
Other	218	(32.9%)
Personality/Alcoholism	444	(67.1%)
ALCOHOL PROBLEM?		
No	298	(45.0%)
Yes	364	(55.0%)
HEROIN/OPIATES?		
No	645	(97.4%)
Yes	17	( 2.6%)
OTHER DRUGS?		
No	589	(89.0%)
Yes	73	(11.0%)
PSYCHOLOGICAL TREATMENT RECOMMENDED?		
No	575	(86.9%)
Yes	87	(13.1%)
COUNSELING RECOMMENDED?		
None	102	(15.4%)
Other	560	(84.6%)
A.A. OR N.A. ACTIVITY?		
None	403	(60.9%)
Other	259	(39.1%)
INSTITUTION RECOMMENDED		
State Penitentiary	283	(42.7%)
Other	379	(57.3%)
INSTITUTION ASSIGNED		
Washington State Penitentiary	289	(43.7%)
Other	373	(56.3%)
INSTITUTIONAL TRANSFER?		
No	507	(76.6%)
Yes	155	(23.4%)
# PROSECUTABLE INFRACTIONS		
None	621	(93.8%)
One or More	41	( 6.2%)

Variable .....	Number	Percent
# NON-PROSECUTABLE INFRACTIONS		
None	350	(52.9%)
One or More	312	(47.1%)
# COMPLETED ESCAPES		
None	620	(93.7%)
One or More	42	( 6.3%)
WORK OR TRAINING RELEASE PROGRAM		
No	632	(95.5%)
Yes	30	( 4.5%)
PAROLE PLAN		
Other	554	(83.7%)
Residence & Employment	108	(16.3%)
WILL LIVE WITH?		
Other	470	(71.0%)
Live with Wife	192	(29.0%)
MARITAL STATUS AT PAROLE		
No Change	578	(87.3%)
Other	84	(12.7%)
OUTSIDE AGENCY SUPPORT		
None	605	(91.4%)
Other	57	( 8.6%)
INSTITUTION PAROLING		
Washington State Penitentiary	262	(39.6%)
Other	400	(60.4%)
AGE AT ADMISSION		
25 Years or Less	330	(49.8%)
More than 25 Years	332	(50.2%)
TIME SERVED		
Less than 20 Months	331	(50.0%)
20 Months or More	331	(50.0%)
PAROLE OUTCOME		
Success	510	(77.0%)
Failure	152	(23.0%)

Washington B.E. Study, Regression

The Washington B.E. study data set included parole performance codes compatible with Uniform Parole Reports definition. The codes were collapsed into the two parole performance measures, one a continuous scale, the other a dichotomy, described above. Each of the dependent measures were analysed as described on p. 14. The results of the regression are presented in Table 73. Three aspects of Table 73 seem most worthy of comment. First, this data set, which had available in it more predictors, resulted in equations with higher  $R^2$ 's and more significant predictors than did the analysis performed on the more limited UPR data set.

Second, the previously noted finding that the equation to predict the continuously scaled criterion is more powerful and includes more significant variables is again found here.

Third, the validation  $R$ 's suggest that the constructed equations are noticeably more effective in the second validation sample than in the first. This finding will be further discussed in the Comparison of Methods section. The variables found to be significant predictors of each of the outcome measures are shown in Table 73. The reader is reminded that a negative slope indicates that the associated variable is a positive one, that is its presence, or presence in a greater degree, is indicative of better parole performance.



TABLE 73

## SUMMARY OF FINAL REGRESSION EQUATIONS FOR WASHINGTON B.E. STUDY DATA

DEPENDENT VARIABLE	VARIABLES SELECTED	SLOPE	BETA	F TO REMOVE	OVERALL F	CONSTRUCTION R <sup>2</sup>	VALIDATION R <sup>2</sup> Sample 1/Sample 2
Dichotomized Parole Performance	# of Aliases	.03923	.08274	4.87280	6.70354	.11028	.0288/ .0402
	Age at 1st Juv. Com.	-.03366	-.56286	7.42635			
	Age at 1st Juv. Com. =missing (Dummy variable)	.57550	.65355	9.91788			
	# of felony viola- tions	-.05810	-.10128	4.05857			
	Felony violation	.12424	.12804	6.46437			
	# of prosecutable infractions	.18859	.11587	8.86603			
	# of non-prosecu- table infractions	.02598	.16452	14.33230			
	Parole Plan	-.01030	-.09048	5.77289			
	Time Served	-.00275	-.12966	9.42558			
	Age at 1st Adult commitment	-.00509	-.09892	5.90050			
	Employment last 2 years	.06928	.07882	4.09935			
	AA/NA Activity	.06577	.07631	3.90925			
	Constant	.2806					

Table continued

TABLE 73 (Con't)

DEPENDENT VARIABLE	VARIABLES SELECTED	SLOPE	BETA	F TO REMOVE	OVERALL F	CONSTRUCTION R <sup>2</sup>	VALIDATION R <sup>2</sup> Sample 1/Sample 2
Continuously scaled Parole Performance	Admission Type	.88669	.19811	8.57049	7.30167	.15335	.06140 .07110
	Commitment Type	.69874	.15310	4.55074			
	Prior Arrests	.04085	.15259	11.86617			
	Age at 1st Juv. Com.	-.16366	-.51440	6.45779			
	Age at 1st Juv. Com. missing (Dummy variable)	2.81996	.60192	8.77056			
	# of felony viola- tions	-.31850	-.10436	4.28194			
	Public assistance at arrest	-1.06824	-.10027	6.24872			
	# Dep. receiving Public assistance at arrest	.16941	.07630	3.11250			
	Employment last 2 years	.46842	.10018	6.65034			
	AA/NA activity	.49052	.10699	7.70841			
	# non-prosecu- table infractions	.13392	.15942	13.43165			
	# of completed escapes	.99753	.11257	8.89752			
	Parole Plan	-.74816	-.12355	11.16495			
	Age at admission	-.00220	-.11786	6.19616			
	Time Served	-.01771	-.15693	13.79030			
	Felony violation	.56439	.10933	3.95060			
	Constant	1.0943					



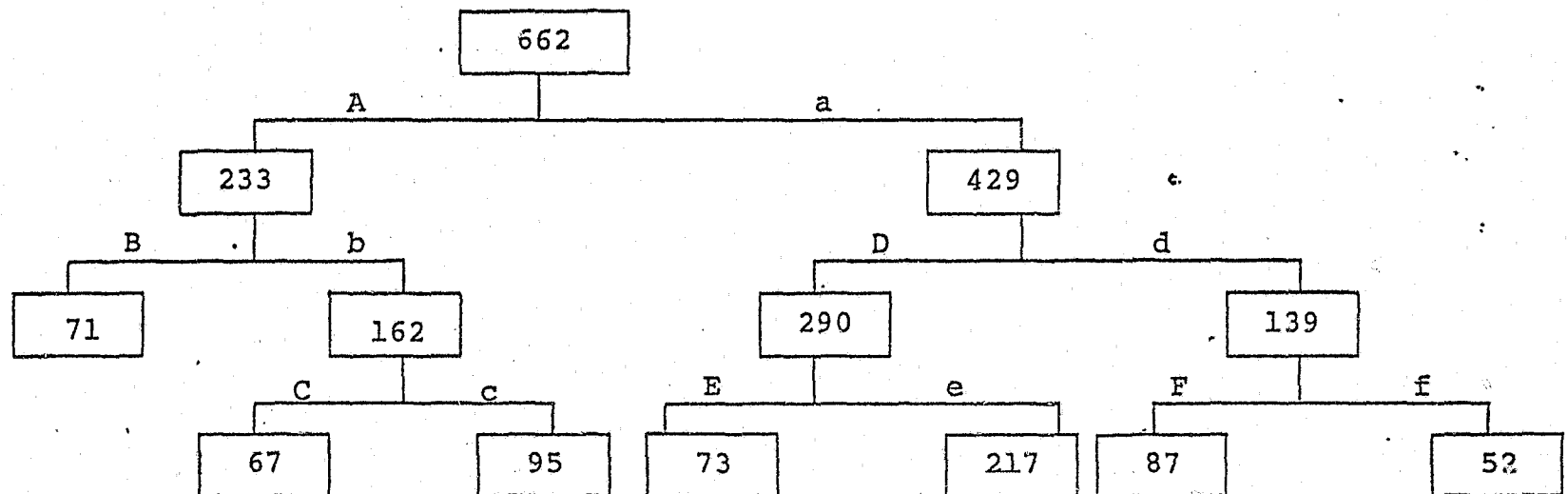
Washington B.E. Study, Predictive Attribute Analysis

A Predictive Attribute Analysis of the Washington B.E. Study data produced seven terminal subgroups with a 47.8% divergence in success rates between the least successful and the most successful groups. The primary split was on record of Juvenile Commitment. Further divisions among individuals with a record of Juvenile Commitments proceeded on the basis of Dependents at Arrest and Involvement with Alcohol. Parolees with a record of Juvenile Commitment, no Dependents at Arrest, and who were arrested for crimes which involved Alcohol were, as a group, most likely to fail on parole (success rate = 52.2%).

Individuals with no record of Juvenile Commitment were split into four terminal subgroups on the basis of Problems Keeping a Job and the number of Prior Washington Commitments. The most successful subgroup (success rate = 100%) was characterized by no Juvenile Commitments, Problems Keeping a Job other than for reasons of personality or absenteeism due to alcoholism, and the commission of an offense against persons rather than property.



PREDICTIVE ATTRIBUTE ANALYSIS  
WASHINGTON/B.E. STUDY



Age/1st Juvenile Commitment  
# Dependents at Arrest  
Alcohol Involved  
Problem Keeping Job  
# Prior Washington Commitments  
Offense

A. Other  
B. One or More  
C. Yes  
D. Personality/Alcoholism  
E. One or More  
F. Property

a. None  
b. None  
c. No  
d. Other  
e. None  
f. Person

Figure 9

TABLE 74  
TERMINAL SUBGROUPS  
PREDICTIVE ATTRIBUTE ANALYSIS  
WASHINGTON/B.E. STUDY

TERMINAL SUBGROUP NUMBER 1

N = 71

Subgroup Characteristics: Age/1st Juvenile Commit-  
ment = Other  
# Dependents at Arrest =  
One or More

Success Rate = 81.7%

TERMINAL SUBGROUP NUMBER 2

N = 67

Subgroup Characteristics: Age/1st Juvenile Commit-  
ment = Other  
# Dependents at Arrest =  
None  
Alcohol Involved = Yes

Success Rate = 52.2%

TERMINAL SUBGROUP NUMBER 3

N = 95

Subgroup Characteristics: Age/1st Juvenile Commit-  
ment = Other  
# Dependents at Arrest =  
None  
Alcohol Involved = No

Success Rate = 71.6%

TERMINAL SUBGROUP NUMBER 4

N = 73

Subgroup Characteristics: Age/1st Juvenile Commit-  
ment = None  
Problem Keeping Job =  
Personality/Alcoholism  
# Prior Washington Commit-  
ments = One or More

Success Rate = 64.4%

TERMINAL SUBGROUP NUMBER 5

N = 217

Subgroup Characteristics: Age/1st Juvenile Commit-  
ment = None  
Problem Keeping Job =  
Personality/Alcoholism  
# Prior Washington Commit-  
ments = None

Success Rate = 80.6%

TERMINAL SUBGROUP NUMBER 6

N = 87

Subgroup Characteristics: Age/1st Juvenile Commit-  
ment = None  
Problem Keeping Job =  
Other  
Offense = Property

Success Rate = 86.2%

TERMINAL SUBGROUP NUMBER 7

N = 52

Subgroup Characteristics: Age/1st Juvenile Commit-  
ment = None  
Problem Keeping Job =  
Other  
Offense = Person

Success Rate = 100.0%

TABLE 75

SUCCESS RATES FOR TERMINAL SUBGROUPS  
 PREDICTIVE ATTRIBUTE ANALYSIS  
 WASHINGTON/B.E. STUDY

CONSTRUCTION  
 (N = 662)

Group	Success		Failure		Total
	N	%	N	%	
7	52	100.0	0	0.0	52
6	75	86.2	12	13.8	87
1	58	81.7	13	18.3	71
5	175	80.6	42	19.4	217
3	68	71.6	27	28.4	95
4	47	64.4	26	35.6	73
2	35	52.2	32	47.8	67
M.C.R. = .359 eta <sup>2</sup> = .081					

TABLE 76

SUCCESS RATES FOR TERMINAL SUBGROUPS  
 PREDICTIVE ATTRIBUTE ANALYSIS  
 WASHINGTON/B.E. STUDY

Group	Success		Failure		Total
	N	%	N	%	
VALIDATION #1 (N = 592)					
7	48	94.1	3	5.9	51
6	70	78.7	19	21.3	89
1	34	82.9	7	17.1	41
5	158	77.5	46	22.5	204
3	44	58.7	31	41.3	75
4	43	61.4	27	38.6	70
2	36	58.1	26	41.9	62
M.C.R. = .291 eta <sup>2</sup> = .052					
VALIDATION #2 (N = 596)					
7	40	88.9	5	11.1	45
6	67	78.8	18	21.2	85
1	39	81.2	9	18.8	48
5	156	76.1	49	23.9	205
3	50	61.7	31	38.3	81
4	45	72.6	17	27.4	62
2	52	74.3	18	25.7	70
M.C.R. = .141 eta <sup>2</sup> = .008					

Washington B.E. Study, Association Analysis

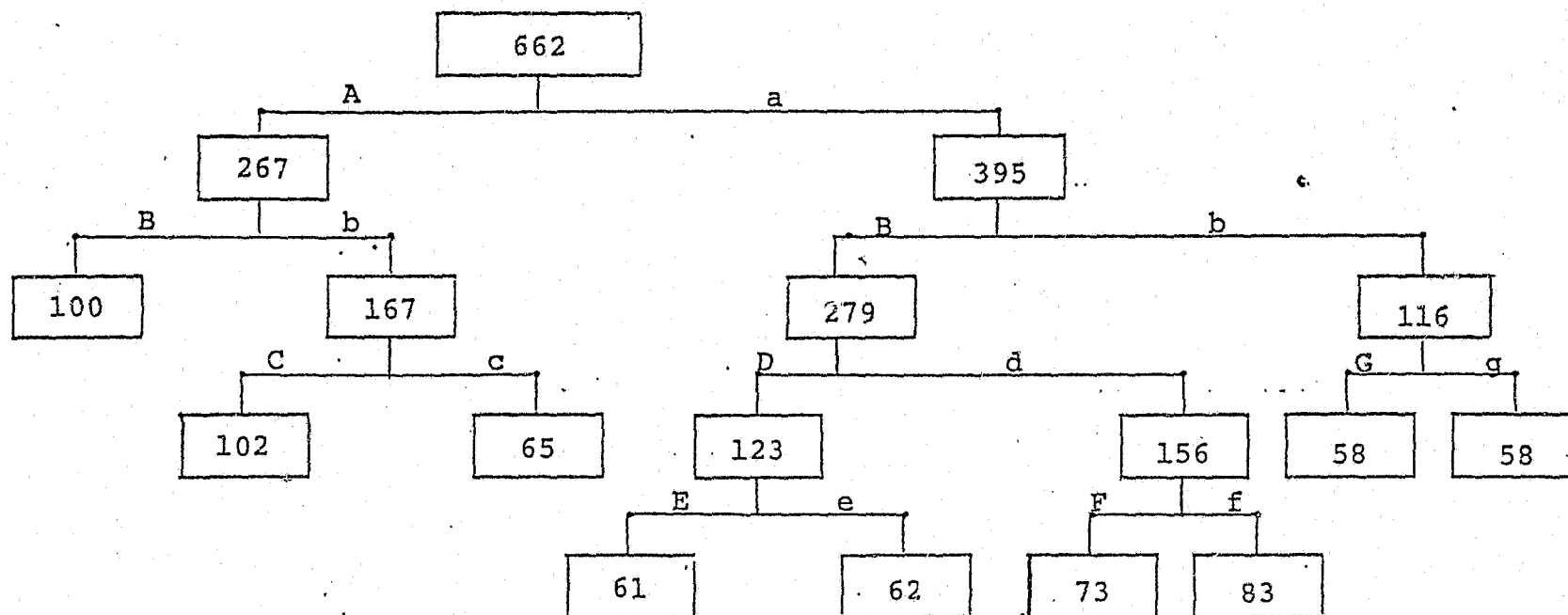
An Association Analysis of the Washington data produced nine terminal subgroups of between 58 and 100 individuals. The divergence in success rates was not as great as for the Predictive Attribute Analysis. The group with the lowest success rate (70.0%) is characterized by one or more Prior Washington Admissions and Institution Recommended other than the State Penitentiary. Other subdivisions on this branch of the analysis proceeded on the basis of whether or not those recommended to the State Penitentiary had Prior Washington Commitments.

A greater number of subdivisions occur among parolees with no Prior Washington Admissions. Institution Recommended provides the secondary split on this branch also. Further divisions, however, proceed on Marital Status, Alcohol Problem, and Minimum Sentence by Prosecuting Attorney, for those recommended to institutions other than the State Penitentiary. Where the Institution Recommended is the State Penitentiary, terminal subgroups are identified only by the number of Prior Commitments. The most successful group (success rate = 91.4%) is characterized by no Prior Washington Admissions, recommendation to the State Penitentiary, and no Prior Commitments.





ASSOCIATION ANALYSIS  
WASHINGTON/B.E. STUDY



# Prior Washington Admissions	A. One or More	a. None
Institution Recommended	B. Other	b. State Penitentiary
# Prior Washington Commitments	C. One or More	c. None
Marital Status	D. Other	d. Single
Alcohol Problem?	E. Yes	e. No
Minimum Sentence/P.A.	F. More than 36 Months	f. 36 Months or Less
# Prior Commitments	G. One or More	g. None

Figure 10

TABLE 77  
TERMINAL SUBGROUPS  
ASSOCIATION ANALYSIS  
WASHINGTON/B.E. STUDY

TERMINAL SUBGROUP NUMBER 1

N = 100

Subgroup Characteristics: # Prior Washington Admissions = One or More  
Institution Recommended = Other

Success Rate = 70.0%

TERMINAL SUBGROUP NUMBER 2

N = 102

Subgroup Characteristics: # Prior Washington Admissions = One or More  
Institution Recommended = State Penitentiary  
# Prior Washington Commitments = One or More

Success Rate = 71.6%

TERMINAL SUBGROUP NUMBER 3

N = 65

Subgroup Characteristics: # Prior Washington Admissions = One or More  
Institution Recommended = State Penitentiary  
# Prior Washington Commitments = None

Success Rate = 76.9%

TERMINAL SUBGROUP NUMBER 4

N = 61

Subgroup Characteristics: # Prior Washington Admissions = None  
Institution Recommended = Other  
Marital Status = Other  
Alcohol Problem = Yes

Success Rate = 82.0%

TERMINAL SUBGROUP NUMBER 5

N = 62

Subgroup Characteristics: # Prior Washington Admissions = None  
Institution Recommended = Other  
Marital Status = Other  
Alcohol Problem = No

Success Rate = 80.6%

TERMINAL SUBGROUP NUMBER 6

N = 73

Subgroup Characteristics: # Prior Washington Admissions = None  
 Institution Recommended = Other  
 Marital Status = Single  
 Minimum Sentence/PA = More than 36 Months

Success Rate = 76.7%

TERMINAL SUBGROUP NUMBER 7

N = 83

Subgroup Characteristics: # Prior Washington Admissions = None  
 Institution Recommended = Other  
 Marital Status = Single  
 Minimum Sentence/PA = 36 Months or Less

Success Rate = 74.7%

TERMINAL SUBGROUP NUMBER 8

N = 58

Subgroup Characteristics: # Prior Washington Admissions = None  
 Institution Recommended = State Penitentiary  
 # Prior Commitments = One or More

Success Rate = 79.3%

TERMINAL SUBGROUP NUMBER 9

N = 58

Subgroup Characteristics: # Prior Washington Admissions = None  
 Institution Recommended = State Penitentiary  
 # Prior Commitments = None

Success Rate = 91.4%

TABLE 78

SUCCESS RATES FOR TERMINAL SUBGROUPS  
 ASSOCIATION ANALYSIS  
 WASHINGTON/B.E. STUDY  
 CONSTRUCTION  
 (N = 662)

Group	Success		Failure		Total
	N	%	N	%	
9	53	91.4	5	8.6	58
4	50	82.0	11	18.0	61
5	50	80.6	12	19.4	62
8	46	79.3	12	20.7	58
3	50	76.9	15	23.1	65
6	56	76.7	17	23.3	73
7	62	74.7	21	25.3	83
2	73	71.6	29	28.4	102
1	70	70.0	30	30.0	100
M.C.R. = .179					
eta <sup>2</sup> = .020					

TABLE 79

SUCCESS RATES FOR TERMINAL SUBGROUPS  
ASSOCIATION ANALYSIS  
WASHINGTON/B.E. STUDY

Group	Success		Failure		Total
	N	%	N	%	
VALIDATION #1 (N = 592)					
9	39	81.2	9	18.8	48
4	29	76.3	9	23.7	38
5	37	86.0	6	14.0	43
8	56	82.4	12	17.6	68
3	45	66.2	23	33.8	68
6	42	77.8	12	22.2	54
7	58	70.7	24	29.3	82
2	67	63.8	38	36.2	105
1	60	69.8	26	30.2	86
M.C.R. = .155 eta <sup>2</sup> = .013					
VALIDATION #2 (N = 596)					
9	45	88.2	6	11.8	51
4	43	93.5	3	6.5	46
5	40	93.0	3	7.0	43
8	39	73.6	14	26.4	53
3	48	62.3	29	37.7	77
6	39	75.0	13	25.0	52
7	58	70.7	24	29.3	82
2	67	74.4	23	25.6	90
1	70	68.6	32	31.4	102
M.C.R. = .191 eta <sup>2</sup> = .022					



**CONTINUED**

**5 OF 6**



Washington B.E. Study, Burgess

The prediction of parole outcome among Washington parolees with the Burgess technique was based on twenty significant predictor variables presented in Table 80. The point bi-serial  $r^2$  between actual parole outcome and the Burgess predictive scores obtained with this base expectancy model is .0595, a somewhat more powerful result than was achieved with the Burgess analyses of the other CPDP data sets. On validation, there was shrinkage by about three percentage points ( $r^2 = .0299$ ) with the first validation sample. However, the amount of variance explained on construction held up much better with the second validation sample which yielded an  $r^2$  of .0420. These less than dramatic results are, again, perhaps an indication of the absence of linear relationships in the CPDP data with respect to predictor variables and parole outcome.

TABLE 80  
BURGESS B.E. PREDICTOR VARIABLES  
WASHINGTON/B.E. STUDY  
(% Success for Construction Sample = 77.0%)

Variable	$\chi^2$ with Parole Outcome*	Category Associated with Parole Success	% Success
Marital Status	5.523	Other	81.5
Admission Type	6.581	First Admission	81.3
Commitment Type	3.861	Other	79.8
Offense	9.205	Person	86.6
Weapons Involved?	6.610	Yes	88.0
Force Involved ?	6.979	Yes	88.6
Maximum Sentence	10.819	More than 15 Yrs.	84.5
Age/1st Juvenile Apprehension	4.608	None	81.9
Age/1st Juvenile Commitment	12.133	None	81.4
# Prior Washington Commitments	5.491	None	79.1
# Prior Washington Admissions	5.277	None	80.3
# Prior Admissions	7.297	None	81.2
# Felony Violations	7.474	None	80.1
Felony Violation	5.892	None/Person	79.4
# Dependents at Arrest	9.343	One or More	83.7
Type Vocational Training	4.217	None	79.1
Employment/Last 2 Years	7.887	Other	80.6
# Prosecutable Infractions	7.381	None	78.3
# Non-Prosecutable Infractions	4.823	None	80.6
# Completed Escapes	6.757	None	78.2

\* $\chi^2$  significant at .05 level

## WASHINGTON B.E. STUDY, COMPARISON OF METHODS

In Table 81 MCR's and  $r^2$  or  $\eta^2$  pertaining to the analyses of the Washington B.E. Study data are presented. As previously only the regression on the dichotomous criterion is included so as to maintain comparability.

The multiple regression and Burgess Methods demonstrated approximately equal power upon validation, with the validation of the predictive attribute technique being superior in one validation sample and inferior in the other. The association analysis results are less predictive but this finding is consistent with prior experiences with the technique.

As mentioned earlier the original study design under which these data were collected provided for two validation samples, the first a group of persons paroled during the same time period as the construction sample. The second validation sample was selected from a subsequent time period so as to allow a test of the hypothesis that through time changes in relationship with parole performance will result in a reduction in the predictive power of a risk estimating device. That no support has been found for this hypothesis is evident from the fact that, with the exception of the predictive attribute technique, validation coefficients are higher for the second (later)

validation sample than for that shown from parolees released in the same time period as the construction sample. This finding raises many questions whose investigation was precluded by time and resource constraints and underscores the previously noted uncertain behavior of the predictive attribute technique.

TABLE 81

RELATIVE POWER OF PREDICTIVE METHODS  
WASHINGTON/B.E. STUDY

	Mean Cost Rating			$r^2$ or $\eta^2$		
	Construction	Validation #1	Validation #2	Construction	Validation #1	Validation #2
Burgess	.331	.200	.251	.0595	.0299	.0420
Regression	.374	.207	.296	.1103	.0288	.0402
Predictive Attribute Analysis	.359	.291	.141	.081	.052	.008
Associa- tion Analysis	.179	.155	.191	.020	.013	.022

TABLE 82

MULTIPLE REGRESSION: PAROLE EXPECTANCY RATES  
WASHINGTON/B.E. STUDY  
(Construction)

Score Categories	Success	Failure	Total
< -9	2 100.0%	0 0.0%	2 0.3%
-9- 5	54 96.4%	2 3.6%	56 8.5%
6- 20	206 86.6%	32 13.4%	238 36.0%
21- 35	184 72.4%	70 27.6%	254 38.4%
36- 50	55 64.7%	30 35.3%	85 12.8%
51- 65	9 37.5%	15 62.5%	24 3.6%
> 65	0 0.0%	3 100. %	3 0.4%
Total	510 77.0%	152 23.0%	662 100.0%

$r = .3321$   
M.C.R. = .374

TABLE 83

MULTIPLE REGRESSION: PAROLE EXPECTANCY RATES  
WASHINGTON/B.E. STUDY  
(Validation #1)

Score Categories	Success	Failure	Total
< -9	6 100.0%	0 0.0%	6 1.0%
-9- 5	44 83.0%	9 17.0%	53 9.0%
6- 20	170 79.8%	43 20.2%	213 36.0%
21- 35	158 67.0%	78 33.0%	236 39.9%
36- 50	45 71.4%	18 28.6%	63 10.6%
51- 65	8 44.4%	10 55.6%	18 3.0%
> 65	1 33.3%	2 66.7%	3 0.5%
Total	432 73.0%	160 27.0%	592 100.0%

$r = .1697$   
M.C.R. = .207

TABLE 84

MULTIPLE REGRESSION: PAROLE EXPECTANCY RATES  
 WASHINGTON/B.E. STUDY  
 (Validation #2)

Score Categories	Success	Failure	Total
< -9	7 100.0%	0 0.0%	7 1.2%
-9- 5	40 93.0%	3 7.0%	43 7.2%
6- 20	168 82.4%	36 17.6%	204 34.2%
21- 35	162 74.3%	56 25.7%	218 36.6%
36- 50	51 56.7%	39 43.3%	90 15.1%
51- 65	18 64.3%	10 35.7%	28 4.7%
> 65	3 50.0%	3 50.0%	6 1.0%
Total	449 75.3%	147 24.7%	596 100.0%

$r = .2006$   
 $M.C.R. = .296$



TABLE 85

BURGESS: PAROLE EXPECTANCY RATES  
WASHINGTON/B.E. STUDY  
(Construction)

Score Categories	Success	Failure	Total
>18	6 100.0%	0 0.0%	6 0.9%
16-18	80 97.6%	2 2.4%	82 12.4%
13-15	140 84.3%	26 15.7%	166 25.1%
10-12	130 73.0%	48 27.0%	178 26.9%
7- 9	100 70.4%	42 29.6%	142 21.5%
4- 6	48 60.8%	31 39.2%	79 11.9%
< 4	6 66.7%	3 33.3%	9 1.4%
Total	510 77.0%	152 23.0%	662 100.0%

$r = .244$   
M.C.R. = .331

TABLE 86

BURGESS: PAROLE EXPECTANCY RATES  
 WASHINGTON/B.E. STUDY  
 (Validation #1)

Score Categories	Success	Failure	Total
>18	10 100.0%	0 0.0%	10 1.7%
16-18	51 86.4%	8 13.6%	59 10.0%
13-15	118 81.4%	27 18.6%	145 24.5%
10-12	112 67.5%	54 32.5%	166 28.0%
7- 9	90 65.2%	48 34.8%	138 23.3%
4- 6	44 71.0%	18 29.0%	62 10.5%
< 4	8 66.7%	4 33.3%	12 2.0%
Total	433 73.1%	159 26.9%	592 100.0%

$r = .173$   
 $M.C.R. = .200$

TABLE 87

BURGESS: PAROLE EXPECTANCY RATES  
 WASHINGTON/B.E. STUDY  
 (Validation #2)

Score Categories	Success	Failure	Total
>18	4 80.0%	1 20.0%	5 0.8%
16-18	62 95.4%	3 4.6%	65 10.9%
13-15	114 85.1%	20 14.9%	134 22.5%
10-12	115 68.0%	54 32.0%	169 28.4%
7- 9	100 70.4%	42 29.6%	142 23.8%
4- 6	46 66.7%	23 33.3%	69 11.6%
< 4	8 66.7%	4 33.3%	12 2.0%
Total	449 75.3%	147 24.7%	596 100.0%

$r = .205$   
 $M.C.R. = .251$

## REFERENCES

Babst, D. V., Gottfredson, D. M., and Ballard, K. B. "Comparison of multiple regression and configural analysis techniques for developing base expectancy tables." Journal of Research in Crime and Delinquency, 5(1):1968.

Ballard, K. B. and Gottfredson, D. M. Predictive Attribute Analysis and Prediction of Parole Performance, Vacaville, California: Institute for the Study of Crime and Delinquency, December, 1963.

Burgess, E. W., in Bruce, Harno, Landesco, and Burgess. The workings of the indeterminate sentence law and the parole system in Illinois. Springfield, Illinois: Board of Parole, 1928.

Cormack, R. M. 1971. "A review of classification," J. R. Statist. Soc., A, 134, 321.

Diagnostic Parole Prediction Index. Final report submitted to Corrections Division, Law Enforcement Assistance Administration, Grant Award Number 75-N1-99-0039 by the Research Center, National Council on Crime and Delinquency, Davis, Calif., October, 1975.

Duncan, O. D., and Duncan, B. "A methodological analysis of segregation indexes." American Sociological Review. 20:210-217, 1955.

Duncan, O. D., Ohlin, L. E., Reiss, A. J., Jr., and Stanton, H. R. "Formal devices for making selection decision." American Journal of Sociology 48:573-584, 1953.

Gottfredson, D. M., Ballard, K. B., and Lane, L. Association analysis in a prison sample and prediction of parole performance. Institute for the Study of Crime and Delinquency, 1963.

Gough, H. G. Clinical versus statistical prediction in psychology. In Postman, L. (ed.), Psychology in the making. New York: Knopf, 1962.

Hakeem, Michael. "The Validity of the Burgess Method of Parole Prediction." American Journal of Sociology 53:376-386, March, 1948.

Simon, Frances H. Prediction methods in criminology.  
(Home Office Research Unit Report). London: Her  
Majesty's Stationery Office, 1971.

Simon, Frances H. "Statistical Methods of Making  
Prediction Instruments," Journal of Research in Crime  
and Delinquency, 9(1):46-53, January, 1972.

Wilkins, L. T. and MacNaughton-Smith, P. "New  
prediction classification methods in criminology."  
Journal of Research in Crime and Delinquency. 1:2964.

## PAROLE DATA PROTOTYPE

### NOTES

An information system incorporating all the "essential" and "important" data elements listed in the prototype would allow the user to satisfy the relevant reporting requirements of the Uniform Parole Reports, OBSCIS and NPS data collection systems. These are the minimum expectations for a serviceable parole data system. In the prototype the essential set of elements is considered to form a basis allowing assessment of board decisions and parolee supervision experiences. Some agencies will be faced with difficulties in obtaining uniform and accurate reporting of parole performance (and perhaps other) data, particularly where the parole board exercises no direct control over field supervision functions. Without the essential set of elements proposed here, however, a board cannot expect to monitor its decisionmaking or parole program/placements in terms of parolee outcome (time and nature of technical violations, new offenses, attendant board or other actions, etc.).

All the OBSCIS "core" and a great many of their "recommended" elements are included as essential elements. These may be relevant to parole information in three

respects: first, where parole decisions are based on an inmate's institutional status or experience (custody level, disciplinary infractions, work assignment, etc.); second, where parole agency actions are scheduled (in a managerial sense) to coincide with timing of institutional functions and locations of inmates (e.g., location of inmate due for particular interviews or hearings); and third, where the parole agency contributes to and is serviced by a coherent, centralized data system.

In the first case, the determination to include or exclude particular elements hinges upon the degree that information is considered relevant to parole release or other parole authority decisions. For managerial support, information contemplated by such elements as "Status Action," "Status Location," and "Status Type," may suffice. However, a more management oriented system would include additional data to facilitate scheduling of agency activities (e.g., Date/Time for Initial Interview, Tickler Files (reminders) of cases due for hearing in x months--for assignment to staff members for work up, etc.). Such elements (and report feedback) could be tailored to the individual agency activity structure and organizational needs. This data system description is designed to assure that national data needs, to the degree they are foreseeable, will be satisfied, through a vehicle meeting agency requirements in each topic area.

Superscripts:

1. Element contained in UPR<sup>1</sup>
  2. Element contained in the Core Element set of OBSCIS<sup>2</sup>
  3. Element contained in Recommended set of OBSCIS
  4. Element contained in NPS
  5. Element contained in OBTS system
- a Ethnic group - OBSCIS uses CCH codes
  - b Commitment offense - OBSCIS uses a two part code as follows:

The offense code indicates the major offense for which the offender was committed on the current sentence. The coding structure consists of two parts. (1) The first part is a code for the major offense, which will be specific to each state, depending on the particular state's statutes. (2) The second part of the offense code enables individual states to "translate" their own offense codes into a standardized code to allow for national comparability of offenses.

UPR collects only the second part.

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<sup>1</sup>Neithercutt, M. G., W. H. Moseley, and E. A. Wenk, Uniform Parole Reports: A National Correctional Data System. Davis, California: NCCD Research Center, March 1975, Appendix A.

<sup>2</sup>OBSCIS: Offender-Based State Corrections Information System Volume 1, The OBSCIS Approach. Sacramento: SEARCH Group, Inc., May 1975 and OBSCIS: Offender-Based State Corrections Information System Volume 3, OBSCIS Data Dictionary. SEARCH Group, Inc., May 1975.



- c Date of Execution - This will supply NPS with the fact of execution
- d Number of Prior Parole Releases - OBSCIS terms this element "Parole History"

## PAROLE DATA SYSTEM PROTOTYPE

OffenderEssential ElementsOffender Name<sup>2</sup>

Commitment Name - the commitment name includes the last, first, and middle names of the offender as they appear on the commitment papers

Birth Date<sup>1,2,5</sup>

Month  
Day  
Year

Ethnic Group<sup>1,2,5,a</sup>

Caucasian  
Negro  
Latin American  
American Indian  
Chinese  
Japanese  
Other Oriental  
Other  
Unknown

Sex<sup>1,2,4,5</sup>

Unknown  
Male  
Female

Known Number of Prior Commitments to Adult Correctional Institutions (Reformatories or Prisons)<sup>1,2</sup>

None	Five
One	Six
Two	Seven
Three	Eight
Four	Nine or more

Important ElementsAlias<sup>3</sup>

Indicates prior use of an alias

Birthplace<sup>3</sup>

NCIC standardized state/country codes

Cultural Identification<sup>3</sup>

Whether or not the offender identifies with any particular affinity group

Financial Source<sup>3</sup>

Source of income at time of arrest

Employment<sup>3</sup>

This is a five-part code.

(1) Job Classification denotes the job which the offender perceives as being his most usual occupation. It is coded by the two-digit occupational divisions code outlined in the Dictionary of Occupational Titles.

(2) Employment Status at Time of Arrest is a general code indicating whether the offender was employed full-time, part-time, etc. at the time of his arrest.

(3) Skill Level indicates the level of skill used by the offender in his most usual occupation. (4) Pay Rate is the highest gross income attained in a one-wee.

Essential Elements

Known Number of Prior Sentences  
Excluding Prison and Reformatory  
(including jail, camp, juvenile  
confinement, probation, fines or  
suspended sentences)<sup>1</sup>

None	Five
One	Six
Two	Seven
Three	Eight
Four	Nine or more

Drug Use<sup>1</sup>

0	None or unknown
1	Any use

Alcohol Involvement<sup>1</sup>

0	None or unknown
1	Alcohol involvement

Current Address<sup>2</sup>

The name of the state and county  
in which the offender lived at  
the time of his arrest will be  
recorded under this element.  
The state code is standardized  
and the county code will be  
specific to each state.

FBI Number<sup>2</sup>Intelligence<sup>2</sup>

This element provides for a code  
indicating the offender's  
intelligence category.

Last School Grade Completed<sup>2</sup>Important Elements

period in any job(s), coded  
in dollars. (5) Length of  
Employment is the longest  
period of continuous employ-  
ment of any type coded in  
months.

Offender IQ<sup>3</sup>Legal Name<sup>3</sup>

The legal name includes the  
last, first, and middle  
names as used by the  
offender for legal trans-  
actions. (For various  
reasons, this may differ  
from the commitment name.)

Marital Status<sup>3</sup>

At time of arrest

Number of Dependents<sup>3</sup>

Number claimed on most  
recent tax return

Religious Preference<sup>3</sup>

Denomination or sect

Probation History<sup>3</sup>

This two-part element  
includes the number of  
previous felony probations  
which the offender has  
served, and the number of  
previous misdemeanor  
probations.

Essential ElementsImportant ElementsPhysical and Other Disabilities<sup>2</sup>

This element serves as a flag to indicate where the offender's program or work activities must be restricted due to physiological and/or psychological disabilities.

Yes

No

Tested Grade Level<sup>2</sup>

Grade level test given at initial diagnostic screening

CourtEssential ElementsImportant Elements

Commitment Offense<sup>1,2,b</sup>

Effective Date of Sentence<sup>1,3</sup>

Month

Day

Year

Type of Sentence<sup>1,2</sup>

Simple<sup>1,2</sup>

Multiple<sup>1</sup>

Concurrent<sup>2</sup>

Consecutive<sup>2</sup>

County of Commitment<sup>2</sup>

Unique to each state

Sentence Minimum/Maximum<sup>2,5</sup>

This is a two-part element, specifying the cumulative sentence for the offender. It is coded in years/months/days. The two parts consist of the overall minimum and the overall maximum sentence (i.e., the largest minimum and maximum in the case of consecutive sentences). Life, death, and undetermined sentences will be specified as required by individual states.

Sentence Modification<sup>2</sup>

Indicates whether or not the offender's sentence has been aggravated

Yes

No

InstitutionalizationEssential ElementsDate of Admission to Confinement<sup>1,2,5</sup>

Month  
Day  
Year

Type of Admission<sup>1</sup>

New Court Commitment  
Not by revocation of probation  
Probation revoked

Parole Violator  
Without new court commitment  
With new court commitment

Transfer in from Out of State<sup>4</sup>Escapee Return under Old Sentence<sup>4</sup>Return from Temporary Authorized Absence<sup>4</sup>Date of Execution<sup>4,c</sup>

Month  
Day  
Year

Status Action<sup>2,5</sup>

This element records the reason  
for the offender's latest status  
change.

Status Date<sup>2,5</sup>

This date is the month, day, and  
year when any element of the  
offender's status changes. The  
date, in effect, indicates the  
termination of one status and  
the beginning of the next.

Important ElementsDetainer/Warrant<sup>3</sup>

The detainer/warrant element  
is a three-part code.

(1) The first part indicates  
the number of detainers or  
warrants currently out on an  
offender. (2) The second  
provides for a general code  
indicating the type of war-  
rant or detainer. (3) The  
third part indicates that  
the agency has been notified  
of the offender's location.

Infractions<sup>3</sup>

This is a three-part code.

(1) Infraction Type is a  
code which specifies the  
category of the most recent  
infraction or incidents.  
These include escape,  
fighting, etc. (2) Number  
of Incidents indicates the  
total occurrences of dis-  
ciplinary infractions (i.e.,  
tickets issued) during the  
offender's incarceration.  
(3) Infraction Date is the  
month, day, and year that  
the most recent incident,  
infraction or escape occurred  
while the offender was  
incarcerated or in a partial-  
release program.

Infraction Disposition<sup>3</sup>

This is a two-part element.

(1) Infraction Actions  
indicates the total number of  
times that an offender was  
officially disciplined durin,  
his last period of incarcera-  
tion. (2) Action Date  
indicates the date that the  
most recent disciplinary  
infraction action was taken.

Essential ElementsStatus Jurisdiction<sup>2,5</sup>

This status element is an indication of the entity which has over-all legal authority and responsibility for the offender.

Status Location<sup>2,5</sup>

This refers to the actual physical location of the offender. The coding of this element will be specific to each state. It is suggested that names of locations such as institutions, parole offices, work release centers, half-way houses, diagnostic and classification centers, federal and out-of-state institutions, hospitals, etc., be included in the coding structure.

Status Type<sup>2,5</sup>

The status type refers to the offender's specific standing within the jurisdiction. It provides a general structure for coding such things as admission, institutional, release, discharge, and special status.

Minimum Eligible Parole Date<sup>2</sup>

This is the date on which offender was first eligible for parole, considering the date of custody or admission, the sentence, time credit deductions, and other factors, determined at time of admission or as first set by parole board action. Code in month/day/year.

Important ElementsInstitution Security Level<sup>3</sup>

The required security level of the offender--maximum, medium, and minimum--while he was incarcerated or on a partial-release program is indicated by this element.

Medical Exam<sup>3</sup>

The most recent date that the offender had a medical exam while under the jurisdiction of the corrections authority.

Programs Prescribed<sup>3</sup>

The programs prescribed refer to those programs recommended for the offender by the reception/classification team or by institutional personnel. It is a three-part element, coded for each program that is prescribed: (1) program category, which includes educational, vocational, work assignment, counseling, or other; (2) specific programs recommended for the offender by the reception/classification team or by institutional personnel (this coding structure will be specific to each state and will vary across institutions); and (3) the priority of the program as it relates to the specific offender.

Essential ElementsImportant ElementsProgram Assignment<sup>3</sup>

Program assignment is a four-part element which indicates (1) the general program type to which the offender was assigned, such as work, educational, vocational, counseling, and other; (2) the specific program to which the offender was assigned (this coding structure will be unique to each state); (3) the date the offender entered the program; and (4) the date the offender left the program.



ParoleEssential ElementsDate of Release to Parole<sup>1</sup>

Month  
Day  
Year

Paroling Agency<sup>1,4</sup>Parole Receiving Agency<sup>1</sup>State Corrections Identification Number<sup>1,2,5</sup>

The state corrections identification number is that which is assigned to the offender by the State Department or Division of Corrections or by the correctional institution to which the offender is assigned. States may, under certain circumstances, have the need to assign more than one number. In those cases, the requirement is all numbers, in chronological order of assignment.

OBTS Identification Number<sup>2,5</sup>

This number will be assigned to offender by Offender-Based Transaction System.

Note: This element is for future use.

Important ElementsNext Eligible Parole Date<sup>3</sup>

Month, Day, Year that the offender is next scheduled to appear before the parole board.

Parole Address/Habitation<sup>3</sup>

This is the present location of the offender while on parole. It has two parts: (1) State, using the standardized state, country code developed by NCIC; and (2) County, which will be specific to each state.

Parole Board Decision

Disposition made by the parole board at its most recent hearing.

Parole Special Conditions<sup>3</sup>

Any special conditions which the parole board imposes on the parolee

Parole Supervision Level<sup>3</sup>

The required supervisory level of the parolee, as determined in his parole plan.

Infractions\*

Infractions Dispositions\*

Programs Prescribed\*

Program Assignment\*

\*These items are corollaries of their counterparts in the "Institutionalization" codes. Their definitions will differ from jurisdiction to jurisdiction.

Essential ElementsParole Performance<sup>1</sup>Continued on Parole

Continued - no difficulty or sen-  
on parole tence(s) less than 60  
days

Continued - with new minor convic-  
on parole tion(s)

Continued - with new major convic-  
on parole tion(s)

Absconder

Absconder - by official action or  
whereabouts unknown more  
than two months

Returned to Prison

Returned to - no new conviction(s)  
prison, and not in lieu of  
technical prosecution  
violation

Returned to - new minor or lesser  
prison, conviction(s) or in  
technical lieu of prosecution  
violation on new minor or  
lesser offense(s)

Returned to - in lieu of prosecu-  
prison, tion on new major  
technical offense(s)  
violation

Returned to - prison return does  
prison, no not reflect on per-  
violation formance (see  
examples)

Recommitted to - same jurisdiction  
prison, new  
major conviction(s)

Recommitted to - any other  
prison, new jurisdiction  
major conviction(s)

Other returns - when using this  
to prison code, an explana-  
tion is to be  
written.

Important ElementsParole Financial Status<sup>3</sup>

Primary source of income of  
the offender while he is on  
parole

Time Lost Due to Disciplinary  
Actions<sup>3</sup>

Number of days which the  
offender lost against his  
current sentence due to  
official disciplinary  
actions (resulting from  
parole violations, bond  
escapes, etc.)

Parole Employment/Employer<sup>3</sup>

A two-part element indicat-  
ing: (1) present employment  
status of the parolee (full-  
time, part-time, etc.); and  
(2) general classification  
of the job in which he is  
employed, using the two-  
digit code outlined in the  
Dictionary of Occupational  
Titles.

Time Served with Other  
Agencies<sup>3,5</sup>

This is a two-part code at  
the OBSCIS recommended level:  
(1) a code for each agency,  
institution, etc., granting  
time credit and (2) the total  
time credit for each, coded  
in days.

Number of Prior Parole  
Releases<sup>3,d</sup>Parole Income<sup>3</sup>

Average monthly income in  
dollars of the offender  
while on parole or other  
supervised release.

Essential ElementsDate of Difficulty<sup>1</sup>Month  
Day  
YearNew Offense<sup>1</sup>Same codes as "Commitment  
Offense"Months under Active Parole  
Supervision<sup>1</sup>Months since current parole  
release person has been under  
active supervisionImportant ElementsParole Performance<sup>3</sup>Supervision officer's  
assessment

## Discharge

Essential ElementsDate of Discharge or Death<sup>1</sup>Month  
Day  
YearDeath<sup>1</sup>

Alive

Died - Not result of criminal act

Died - Result of criminal act

Important Elements

Type of Discharge

Expiration of sentence  
Death  
Early

PROTOTYPE DATA SYSTEM\*  
Parole Emphasis

ESSENTIAL

Offender	Court	Institutionalization	Parole	Discharge
Name <sup>2</sup>	Commitment Offense <sup>1,2</sup>	Date of Admission to Confinement <sup>1,2,5</sup>	Date of Release to Parole <sup>1</sup>	Date of Discharge or Death <sup>1</sup>
Date of Birth <sup>1,2,5</sup>	Effective Date of Sentence <sup>1,3</sup>	Type of Admission <sup>1</sup>	Paroling Agency <sup>1,4</sup>	Death <sup>1</sup>
Ethnic Group <sup>1,2,5</sup>	Type of Sentence <sup>1,2</sup>	add: transfer from out of state <sup>4</sup>	Parole Receiving Agency <sup>1</sup>	
Sex <sup>1,2,4,5</sup>	Concurrent <sup>2</sup> Consecutive <sup>2</sup>	escapee return under old sentence <sup>4</sup>	State Corrections Identification Number <sup>1,2,5</sup>	
Number of Prior Prison Commitments (Adult) <sup>1,2</sup>	County (Court) of Commitment <sup>2</sup>	return from temporary authorized absence <sup>4</sup>	OBTS Identification Number <sup>2,5</sup>	
Number of Prior Prison Sentences (except Prior Prison Commitment) <sup>1</sup>	Sentence Minimum/Maximum <sup>2,5</sup>	Date of Execution <sup>4</sup>	Parole Performance <sup>1</sup>	
Drug Use <sup>1</sup>	Sentence Modification <sup>2</sup>	Status Action <sup>2,5</sup>	Date of Difficulty <sup>1</sup>	
Alcohol Involvement <sup>1</sup>		Status Date <sup>2,5</sup>	New Offense <sup>1</sup>	
Current Address <sup>2</sup>		Status Jurisdiction <sup>2,5</sup>	Months under Active Parole Supervision <sup>1</sup>	
FBI Number <sup>2</sup>		Status Type <sup>2,5</sup>		
Intelligence <sup>2</sup>		Minimum Eligible Parole Date <sup>2</sup>		
Last School Grade Completed <sup>2</sup>				
Physical and Other Disabilities <sup>2</sup>				
Tested Grade Level <sup>2</sup>				

IMPORTANT

Alias <sup>3</sup>	Detainer/Warrant <sup>3</sup>	Next Eligible Parole Date <sup>3</sup>	Type of Discharge
Birthplace <sup>3</sup>	Infractions <sup>3</sup>	Parole Address/Habitation <sup>3</sup>	
Cultural Identification <sup>3</sup>	Infraction Disposition <sup>3</sup>	Parole Board Decisions <sup>3</sup>	
Financial Source <sup>3</sup>	Institutional Security Level <sup>3</sup>	Parole Special Conditions <sup>3</sup>	
Employment <sup>3</sup>	Date of Medical Exam <sup>3</sup>	Parole Supervision Level <sup>3</sup>	
IQ <sup>3</sup>	Programs Prescribed <sup>3</sup>	Infractions	
Legal Name <sup>3</sup>	Program Assignment <sup>3</sup>	Infractions Dispositions	
Marital Status <sup>3</sup>		Programs Prescribed	
Number of Dependents <sup>3</sup>		Program Assignment	
Religious Preference <sup>3</sup>		Parole Financial Status <sup>3</sup>	
Probation History <sup>3</sup>		Time Lost per Disciplinary Action <sup>3</sup>	
		Parole Employment/Employer	
		Time Served with Other Agencies <sup>3,5</sup>	
		Number of Prior Parole Releases <sup>3</sup>	
		Parole Income <sup>3</sup>	
		Parole Performance (Officer Assessment) <sup>3</sup>	

\*Able to supply data to: UPR OBSCIS NPS OBTS  
1 2 Core 4 5  
3 Recommended



**END**