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ABSTRACT

The identification of variables useful in the prediction of drug abuse has been the subject of a great deal of research. The research presented in this report attempts to add to the existing collection of information concerning variables useful in the prediction of drug abuse. An experimental instrument, the Social Factors Questionnaire, was examined in terms of its capacity to predict several drug abuse criteria both independently and in combination with other routinely available information. Results indicate that two experimental predictors, the lawlessness and permissiveness scores of the Social Factors Questionnaire, added significant unique variance to the prediction of drug abuse criteria when combined with the basic predictor set. (Author/HMV)

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PREDICTION OF DRUG ABUSE BY THE SOCIAL FACTORS QUESTIONNAIRE

By

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July 1975
Interim Report for Period September 1971 – July 1974

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LELAND D. BROKAW, Technical Director
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Two measures, the lawlessness and permissiveness scores, yielded by a locally developed experimental psychological test were investigated to determine if they added significantly to the prediction of seven drug abuse criteria when combined with available demographic and aptitude variables. The results indicate that both scores add significant predictive variance to the background variables and appear to have considerable success in discriminating between drug abusers and nonabusers.

PREFACE

The work reported in this study was accomplished under Project 7719, Air Force Personnel System Development on Selection, Assignment, Evaluation, Quality Control, Retention, Promotion, and Utilization; Task 771913, Research on the Impact of Socio-political Changes on Personnel Management Devices and Systems.

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PREDICTION OF DRUG ABUSE BY THE SOCIAL FACTORS QUESTIONNAIRE

I. INTRODUCTION

The identification of variables useful in the prediction of drug abuse has been the subject of a great deal of research. Many valuable predictors have resulted from this effort. Blum (1970) successfully established the predictive value of a rather direct measure, expressed as "willingness-to-take-drugs." Carney (1971) identified a measure of "risk-taking" as a potentially useful variable. A number of successful attempts have been accomplished by Personnel Research Division, Air Force Human Resources Laboratory. Mullins, Vitola and Abellera (1973) identified an extensive set of demographic and aptitude variables which proved to be useful in the prediction of drug abuse. Subsequently, Weeks, Mullins and Vitola (1974) developed a noncognitive measure, the Life Values Questionnaire, which successfully discriminated between drug abusers and nonabusers. The research presented in this report attempts to add to the existing collection of information concerning variables useful in the prediction of drug abuse. An experimental instrument, the Social Factors Questionnaire, is examined in terms of its capacity to predict several drug abuse criteria both independently and in combination with other routinely available information.

II. PREDICTOR VARIABLES

The set of predictor variables included a locally developed experimental test which yields two different scores. The description, method of scoring and interpretation of this instrument can be found in Appendix A.

1. Social Factors Questionnaire, Lawlessness score (SF-L)
2. Social Factors Questionnaire, Permissiveness score (SF-P)

The remaining predictor variables consisted of aptitude and demographic information obtained from general personnel files. These variables will be referred to as background variables and are defined as follows:

3. Race (1 Non-black; 0 otherwise). It would have been nice if representatives of all minority groups had been available in large enough numbers to study as separate groups. However, only blacks (12% of the total sample) constituted a minority group large enough for meaningful study. Typically, non-black non-Caucasians constitute between one and two percent of study samples. It is very rare that adding additional minority classifications to a study of this type adds significant unique predictive variance. Of course, a dichotomy could have been formed containing only Caucasians in one group and all non-Caucasians in the other. It was felt, however, that differences among non-Caucasians are so great that any effects attributable to minority group membership would have been attenuated by doing so.

In our files for each subject, there was an indication of the state of his permanent residence prior to entering the Air Force. The various states are collapsed into six geographic areas as follows:

4. Area I, North-Northeast. Maine, New Hampshire, Rhode Island, Vermont, Massachusetts, Connecticut, New York, or New Jersey.

5. Area II, Mid Atlantic–North Central. Delaware, Pennsylvania, Maryland, Virginia, West Virginia, Kentucky, or Ohio.

6. Area III, South-Southwest. Alabama, Florida, N. Carolina, S. Carolina, Georgia, Tennessee, Mississippi, Arkansas, New Mexico, Oklahoma, Louisiana, or Texas.

7. Area IV, Middle West. Illinois, Indiana, Michigan, Missouri, Wisconsin, Colorado, Iowa, Kansas, N. Dakota, S. Dakota, Minnesota, Nebraska, or Wyoming.

8. Area V, Far West-Pacific Coast. Arizona, California, Idaho, Oregon, Montana, Washington, Nevada, Utah, Alaska, or Hawaii.

9. Area VI, Other. Areas of permanent residence other than those listed above.

The remaining background variables were:

10. Airman Qualifying Examination (AQE), Mechanical Aptitude Index (M).
11. AQE, Administrative Aptitude Index (A).
12. AQE, General Aptitude Index (G).
13. AQE, Electronic Aptitude Index (E).
14. Armed Forces Qualification Test (AFQT).
15. Education in years at enlistment.
16. Age in years at enlistment.

III. CRITERION VARIABLES

A self-report background inventory (BI) was administered to each subject of this study. Criterion data were obtained from items of this inventory which concerned the pre-service use of drugs not prescribed by a physician. There were separate questions concerning the subject's pre-service use of cannabis (including marijuana and hashish), barbiturates, heroin, hallucinogens (including LSD, mescaline, DMT, and STP), stimulants (including benzedrine, dexedrine, and methamphetamines) and miscellaneous drugs (including opium, morphine, cocaine, glue, gasoline, and other inhalants). For each of these questions, the subject indicated how often he had used the drug on a scale of "never," "tried it once or twice," "once a month," "once a week," " twice a week" or "daily." The following criterion variables resulted:

17. *Cannabis Abuse.*
18. *Heroin Abuse.*
19. *Barbiturate Abuse.*
20. *Hallucinogen Abuse.*
21. *Stimulant Abuse.*
22. *Miscellaneous Abuse.*
23. *Drug Abuse.* If the subject marked "never" for all the drug items, he was assigned a score of "0" on this variable. If he marked at least one of the drug items somewhere between the alternatives "tried it once or twice" and "daily," inclusive, he was assigned a score of "1."

IV. METHOD

The BI and Social Factors Questionnaire were administered to 1,474 randomly selected male basic trainees at Lackland Air Force Base, Texas, between 1 April and 31 May 1972. Both tests were administered under the identified as opposed to the anonymous condition. Prior to testing, all subjects were asked to respond in an honest manner and were told that test results would be used only for research purposes. They were assured that all results were confidential and would not, in any way, affect their military records. Even with these precautions, it is probable that some individuals who had used drugs did not admit it and it is possible that others who had never used drugs claimed they did. To the extent that such dishonest responding occurred, the conclusions reached in this study will be conservative. Any differences between drug-using subjects and others will be diluted to the extent that they are incorrectly identified.

The BI was administered last. Those items of the BI which concern drug abuse involve only pre-service experience with drugs. At the time of data collection, AFR 30-19, which established the disposition of airmen identified as pre-service drug abusers, directed that those individuals with more than four uses of marijuana and/or *any* history of LSD, dangerous drug or narcotic use would not be accepted for service. However, in some instances waivers were granted for applicants who exceeded these minimums.

The Social Factors Questionnaire and background variables were subjected to a series of multiple linear regression analyses to determine whether or not the experimental predictors added any significant validity to the background variables in predicting the drug abuse criteria. This technique involves the computation of an R^2 for a set of predictor variables (the full model), and another R^2 for some subset of these predictor variables (the restricted model). The difference between these two R^2's is then tested for significance. If no significant difference is found between the two R^2's, the interpretation is that those variables in the full model that are not in the restricted model add nothing in predicting the criterion and can be discarded from the predictor set without affecting validity. A complete description of this technique is available elsewhere (Bottenberg & Ward, 1963).

V. RESULTS AND DISCUSSION

Means and standard deviations for predictors and criterion variables are reported in Table 1. An intercorrelation matrix for all predictors and criterion variables is presented in Table 2. The validities

Table 1. **Means and Standard Deviations of Predictor and Criterion Variables**
(N = 1,474)

	Varible Number	Variables	Mean	SD
Predictors				
	1	Social Factors, Lawlessness Score	8.37	5.28
	2	Social Factors, Permissiveness Score	5.04	3.20
	3	Race (1 if Non-black; 0 otherwise)	0.88	0.32
	4	Area I, North-Northeast (1 if Area I; 0 otherwise)	0.15	0.36
	5	Area II, Mid Atlantic–North Central (1 if Area II; 0 otherwise)	0.18	0.38
	6	Area III, South-Southwest (1 if Area III; 0 otherwise)	0.29	0.45
	7	Area IV, Middle West (1 if Area IV; 0 otherwise)	0.21	0.41
	8	Area V, Far West-Pacific Coast (1 if Area V; 0 otherwise)	0.16	0.37
	9	Area VI, Other (1 if Area VI; 0 otherwise)	0.01	0.08
	10	AQE – Mechanical	59.35	20.87
	11	AQE – Administrative	57.66	20.98
	12	AQE – General	63.65	18.29
	13	AQE – Electronic	63.25	20.73
	14	AFQT	62.82	20.20
	15	Education Level	11.82	1.08
	16	Age at Enlistment	19.20	1.55
Criteria				
	17	Cannabis Abuse	0.32	0.89
	18	Heroin Abuse	0.03	0.29
	19	Barbiturate Abuse	0.07	0.42
	20	Hallucinogen Abuse	0.08	0.43
	21	Stimulant Abuse	0.09	0.48
	22	Miscellaneous Abuse	0.25	1.05
	23	Drug Abuse (1 if Drug Abuser; 0 otherwise)	0.22	0.42

Table 2. **Intercorrelation Matrix for Predictors and Criteria**
(N = 1,474)

Variable Number[a,b]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	—	64	−10	07	−04	−11	05	05	02	−06	−03	00	−02	−01	−02	−06	32	10	17	23	22	02	24
2	—	—	−08	05	−04	−12	04	11	02	01	03	07	04	06	00	−03	18	04	05	10	11	−02	10
3	—	—	—	05	−03	−11	02	12	−08	29	20	23	28	30	02	00	02	−07	01	02	02	−06	−06
4	—	—	—	—	−20	−27	−22	−19	−03	−07	−02	−02	−02	03	−09	−03	01	01	00	01	−02	01	−01
5	—	—	—	—	—	−30	−24	−20	−04	−07	−02	−04	−05	−06	−02	−04	−03	00	−03	−03	03	−04	−05
6	—	—	—	—	—	—	−33	−28	−05	−02	−06	−06	−06	−09	−01	06	−06	00	01	01	03	08	01
7	—	—	—	—	—	—	—	−23	−04	06	05	05	06	06	04	−04	08	02	03	04	04	−03	05
8	—	—	—	—	—	—	—	—	−03	10	06	09	09	10	09	03	−01	−04	−01	−04	−02	−03	−01
9	—	—	—	—	—	—	—	—	—	−01	−02	−03	−04	−08	−02	05	02	02	01	01	00	02	02
10	—	—	—	—	—	—	—	—	—	—	45	69	74	65	21	09	−03	−07	−08	−04	−01	−09	−08
11	—	—	—	—	—	—	—	—	—	—	—	76	66	53	33	13	−05	−04	−05	−04	−05	−10	−09
12	—	—	—	—	—	—	—	—	—	—	—	—	79	66	30	12	−01	−03	−04	−02	−01	−08	−06
13	—	—	—	—	—	—	—	—	—	—	—	—	—	73	29	10	−02	−06	−04	−01	−01	−10	−08
14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	19	08	01	−05	−01	−01	02	−09	−05
15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	43	−10	00	−08	−07	06	−10	−13
16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	−04	00	−01	−05	−03	−06	−05
17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	32	54	66	65	01	67
18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	44	44	37	04	19
19	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	65	63	10	29
20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	82	10	33
21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	05	33
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	44
23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Note. — See Table 1 for identification of variables; decimal points omitted preceding correlation coefficients.

[a]An r of .05 is significant at the .05 level.

[b]An r of .07 is significant at the .01 level.

produced by the SF-L score were significant well beyond the .01 level for all criterion variables except miscellaneous abuse. Furthermore, these significant validities were the highest produced by the entire predictor set. The SF-P score produced significant validities for all drug abuse criteria except heroin and miscellaneous abuse. The significant validities yielded by this predictor were exceeded only by those yielded by the SF-L score. These validities represent the correlations between the SF scores and the criterion variables when the SF scores are taken singly. The two separate SF scores were then investigated to see how much they increased prediction of the various criterion measures when they were *added to* a set of background variables routinely available. Regression analysis is the proper statistical approach to this set of problems.

Results of the regression analysis for the cannabis abuse criterion are reported in Table 3. Both the SF-L score and the SF-P score added significantly to the background variables in the prediction of this criterion.

Table 3. **Regression Analysis of Predictors for the Cannabis Abuse Criterion**
(N = 1,474)

Predictors	R^2	Significance Level[a]
Restricted Model: Background Variables only - Race (1); Geographic Area (6); AQE - M,A,G,E; AFQT; Education Level; Age at Enlistment.	.0249	
Full Model I: Background Variables and Social Factors Questionnaire – Lawlessness Score.	.1223	.01
Full Model II: Background Variables and Social Factors Questionnaire – Permissiveness Score.	.0531	.01

[a].01 = Difference between full and restricted model significant at the .01 level.

Table 4 presents the results of the regression analysis for the heroin abuse criterion. These comparisons indicate that only the SF-L score adds significant variance to that already accounted for by the background variables in the prediction of heroin abuse.

Table 4. **Regression Analysis of Predictors for the Heroin Abuse Criterion**
(N = 1,474)

Predictors	R^2	Significance Level[a,b]
Restricted Model: Background Variables only - Race (1); Geographic Area (6); AQE - M,A,G,E; AFQT; Education Level; Age of Enlistment.	.0135	
Full Model I: Background Variables and Social Factors Questionnaire – Lawlessness Score.	.0225	.01
Full Model II: Background Variables and Social Factors Questionnaire – Permissiveness Score.	.0145	NS

[a]NS = Difference between full model and restricted model not significant.

[b].01 = Difference between full and restricted model significant at the .01 level.

Table 5 presents the results of the regression analysis for the barbiturate abuse criterion. Only the SF-L score appears to add significant variance to the background variables in the prediction of this criterion.

Table 5. **Regression Analysis of Predictors for the Barbiturate Abuse Criterion**
(N = 1,474)

Predictors	R^2	Significance Level[a,b]
Restricted Model: Background Variables only - Race (1); Geographic Area (6); AQE - M,A,G,E; AFQT; Education Level; Age at Enlistment.	.0194	
Full Model I: Background Variables and Social Factors Questionnaire – Lawlessness Score.	.0461	.01
Full Model II: Background Variables and Social Factors Questionnaire – Permissiveness Score.	.0214	NS

[a]NS = Difference between full model and restricted model not significant.

[b].01 = Difference between full and restricted model significant at the .01 level.

The results of the analysis for the hallucinogen abuse criterion are presented in Table 6. Combining either the SF-L score or the SF-P score with the background variables significantly increases prediction of this criterion.

Table 6. **Regression Analysis of Predictors for the Hallucinogen Abuse Criterion**
(N = 1,474)

Predictors	R^2	Significance Level[a]
Restricted Model: Background Variables only - Race (1); Geographic Area (6); AQE - M,A,G,E; AFQT; Education Level; Age at Enlistment.	.0146	
Full Model I: Background Variables and Social Factors Questionnaire – Lawlessness Score.	.0670	.01
Full Model II: Background Variables and Social Factors Questionnaire – Permissiveness Score.	.0251	.01

[a].01 = Difference between full and restricted model significant at the .01 level.

Table 7 presents the results of the regression analysis for the stimulant abuse criterion. The addition of either the SF-L score or the SF-P score to the background variables significantly increases the prediction of stimulant abuse.

Table 7. **Regression Analysis of Predictors for the Stimulant Abuse Criterion**
(N = 1,474)

Predictors	R^2	Significance Level[a]
Restricted Model: Background Variables only - Race (1); Geographic Area (6); AQE - M,A,G,E; AFQT; Education Level; Age at Enlistment.	.0142	
Full Model I: Background Variables and Social Factors Questionnaire – Lawlessness Score.	.0641	.01
Full Model II: Background Variables and Social Factors Questionnaire – Permissiveness Score.	.0272	.01

[a].01 = Difference between full and restricted model significant at the .01 level.

The results of the analysis for the miscellaneous abuse criterion are presented in Table 8. These comparisons indicate that the experimental predictors add no significant variance to that already accounted for by the background variables alone. It appears that the use of the Social Factors Questionnaire is not worthwhile in the prediction of miscellaneous abuse.

Table 8. **Regression Analysis of Predictors for the Miscellaneous Abuse Criterion**
(N = 1,474)

Predictors	R^2	Significance Level[a]
Restricted Model: Background Variables only - Race (1); Geographic Area (6); AQE - M,A,G,E; AFQT; Education Level; Age at Enlistment.	.0279	
Full Model I: Background Variables and Social Factors Questionnaire – Lawlessness Score.	.0279	NS
Full Model II: Background Variables and Social Factors Questionnaire – Permissiveness Score.	.0286	NS

[a]NS = Difference between full model and restricted model not significant.

Table 9 presents the results of the regression analysis for the drug abuse criterion. The addition of either the SF-L score or the SF-P score to the background variables significantly increases the prediction of this criterion.

With regard to the R^2's presented in Tables 3 through 9, two important considerations should be mentioned. First, there was undoubltedly some restriction of range on the experimental variables. Since these variables are significantly correlated with drug abuse criteria and most drug abusers are restricted from the Air Force, some restriction of range in the experimental variables inevitably occurs. The second consideration concerns the criterion variables. When drug abuse is distributed in terms of frequency of use, the obtained distribution is very skewed. The largest percentage of cases fall under "no use." A smaller percentage of cases fall under "one use" and smaller and smaller percentages fall under increasingly higher uses. As the number of uses increase, the percentage of cases in each use interval becomes progressively smaller. Consequently, the criterion variables are not normally distributed. Both of the above considerations bear directly on the validities obtained in this study. If the sample of this study had been completely unselected and the criteria had been normally distributed, the validities obtained would

Table 9. Regression Analysis of Predictors for the Drug Abuse Criterion
(N = 1,474)

Predictors	R^2	Significance Level[a]
Restricted Model: Background Variables only - Race (1); Geographic Area (6); AQE - M,A,G,E; AFQT; Education Level; Age at Enlistment.	.0333	
Full Model I: Background Variables and Social Factors Questionnaire – Lawlessness Score.	.0834	.01
Full Model II: Background Variables and Social Factors Questionnaire – Permissiveness Score.	.0417	.01

[a].01 = Difference between full and restricted model significant at the .01 level.

undoubtedly have been higher. Nevertheless, it is important to determine whether or not the two experimental predictors can actually discriminate between drug abusers and nonabusers regardless of the size of the obtained validities.

Tables 10 and 11 present distributions of drug abusers and nonabusers on the basis of the two Social Factors Questionnaire scores. The sample (N = 3,155) used for these distributions includes all those subjects used for the regression analysis plus 1,681 additional subjects who were tested with the Social Factors Questionnaire and BI after the study was in progress, too late to be included in the regression analyses.

Table 10 presents the distribution of drug abusers and nonabusers on the basis of the SF-L score. The distributions are based on the 1,474 subjects used in the regression analyses plus an additional 1,681 cases collected after the regression analyses were completed (total N = 3,155). The difference between the SF-L score means (drug abuser mean = 10.35, SD = 5.95; nonabuser mean = 7.88, SD = 4.76) was found to be significant at the .01 level (two-tailed test). If 11 were designated as the SF-L cut-off score, 42% of the drug abusers would fall above this point as compared to 23% of the nonabusers (difference significant at the .01 level; two-tailed test). In addition, a chi-square statistic was computed to determine if the SF-L score distribution differed for the two values of the drug abuse variable (drug abuser/nonabuser). This statistic was found to be significant well beyond the .01 level (chi-square = 122.61; df = 10).

Table 10. Social Factors Questionnaire, Lawlessness Score vs. Drug Use

Score Intervals	Drug Abusers		Nonabusers	
	N	%	N	%
51–55	0	0	0	0
46–50	0	0	0	0
41–45	0	0	0	0
36–40	1	0	0	0
31–35	4	0	4	0
26–30	7	1	7	0**
21–25	24	4	34	1**
16–20	87	13	111	5**
11–15	166	24	428	17**
06–10	252	37	1,030	42*
00–05	144	21	856	35**
N	685		2,470	

*Difference significant at the .05 level; two-tailed test.

**Difference significant at the .01 level; two-tailed test.

Table 11 displays the distribution of drug abusers and nonabusers by SF-P scores. The difference between the mean SF-P scores for the two groups (drug abuser mean = 5.66, SD = 3.26; nonabuser mean = 4.90, SD = 3.09) was found to be significant at the .01 level (two-tailed test). If 6 were designated as the SF-P cut-off score, 50% of the drug abusers would fall above this point as compared to 38% of the nonabusers (difference significant at the .01 level, two-tailed test). Even though the difference between the mean scores for the two groups is small, the SF-P score does evidence a fair amount of ability to discriminate between the drug abuser and nonabuser groups. A chi-square statistic was also computed for the distribution of SF-P scores and found to be significant at the .01 level (chi-square = 40.15, df = 6). From examination of these distributions, it is evident that the Social Factors Questionnaire is a potentially useful variable in the prediction of drug abuse.

Table 11. Social Factors Questionnaire, Permissiveness Score vs. Drug Use

Score Interval	Drug Abusers		Nonabusers	
	N	%	N	%
12 and above	37	6	78	3**
10–11	55	8	122	5**
8–9	102	15	255	10**
6–7	143	21	497	20
4–5	152	22	605	25
2–3	139	20	599	24*
0–1	57	8	314	13**
N	685		2,470	

*Difference significant at the .05 level, two-tailed test.

**Difference significant at the .01 level, two-tailed test.

VI. CONCLUSIONS

Two experimental predictors, the lawlessness and permissiveness score of the Social Factors Questionnaire, were investigated to determine if they added significantly to the prediction of seven drug abuse criteria when combined with a basic set of predictors consisting of demographic and aptitude variables. Both of these experimental measures added significant unique variance to the prediction of drug abuse criteria when combined with the basic predictor set. Furthermore, the inclusion of these experimental measures with the demographic and aptitude variables resulted in significant multiple validities for all the criterion variables except miscellaneous abuse. It was established, through distributional analyses, that both the social factors – lawlessness and permissiveness scores have considerable success at discriminating between drug abusers and nonabusers.

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APPENDIX A: DESCRIPTION OF THE SOCIAL FACTORS QUESTIONNAIRE

This locally developed experimental instrument consists of seventy multiple choice items for which the number of alternatives range from two to five. Fifty of these items pertain to the extent to which the subject's past behavior has been restrained by the law, or the extent to which other individuals' behavior should be restrained by the law. Each keyed response receives a score of one; no points are awarded otherwise. The lawlessness score is the summation of these fifty item scores. The remaining twenty items concern the disciplinary practices of the individual's parents or guardians. These items are randomly mixed with those which yield the lawlessness score. Again, each keyed response receives a score of one; no points are awarded otherwise. The permissiveness score is the summation of these twenty item scores.

The interpretation of the lawlessness score is very straightforward. The greater this score, the more the individual has either actually participated in or condones illegal behavior. The permissiveness score is similar to the lawlessness score in interpretation and is closely related to it. The greater this score, the more permissive the disciplinary practices of the individual's parents or guardians. It is assumed that the more permissive the rearing of an individual, the less realistic is his evaluation of the punishments resulting from illegal behavior; hence, the greater probability of their occurrence.

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