

Discriminative Features of Alcoholics Classified According to Family History

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By means of discriminant analysis, the frequently proposed distinction of alcoholics according to family history of alcoholism was tested. The most powerful discriminative factors were dysfunctional attitudes, some particular personality characteristics, and perceived parental rearing patterns. The results lend support to the assumption to regard alcoholics with a positive family history of alcoholism as a homogenous subgroup characterized by a specific etiopathogenesis.

Recently, in psychiatry as well as in other medical domains, previously prevailing reductionistic assumptions implying a linear relationship between single factors and pathological manifestations have been challenged. Instead, models have been proposed in which a continuous interaction among biological, psychological, cultural, and social factors is taking place. This interplay between what is inherited and what is acquired during the life cycle is supposed to result in an individual vulnerability, which, according to Tarter and Edwards (1987), is defined as all characteristics of the individual that predispose to an unfavorable outcome. According to Perris (1988), this individual vulnerability is the "very core of all psychopathology" (p. 100). Perris emphasized that the interaction of various etiological factors yields a different result compared with the mere addition of those factors, thus giving the individual an idiosyncratic susceptibility for certain life events.

Because alcohol abuse is so frequent and ubiquitous, it is obvious that its development should involve the interaction of different factors (Cloninger, 1987). Indeed, an increasing number of studies indicate that alcoholism cannot

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be regarded as a single discrete entity, but as a condition in which gender, family history, and personality traits play an important role. Thus, Cloninger, Bohman, and Sigvardsson (1981), describing a cross-fostering analysis of a large sample of adopted men, found the heritability predominantly linked to offspring of the same sex, at least in a special type of alcoholism, the so-called Type 2 or "male-limited." On the other hand, Haver (1986a, 1986b, 1987a, 1987b) found relatively few differences between female and male alcoholism with respect to patterns of consumption, outcome, and relationship with family history.

Penick, Read, Crowley, and Powell (1978) found that alcoholics whose parents or grandparents abused alcohol tended to start drinking at an earlier age and to have more social and personal problems than alcoholics whose parents did not abuse alcohol. The results of Schuckit's studies (1980, 1983a, 1984) support empirical findings regarding differences between alcoholics with or without a family history of alcoholism. Thus, alcoholics with a positive family history of alcoholism (FH+) could be characterized by an early onset, early social problems, and more severe alcohol-related pathology.

More recently, Penick et al. (1987) found, in a large multicenter study of 568 alcoholics divided by family history of alcoholism, that FH+ alcoholics have an earlier onset of alcoholism, a greater severity, more medical and legal problems, an increased lifetime comorbidity, and a larger variety of psychiatric disorders among biological relatives.

During the last decade, the relationship between alcoholism and psychopathic traits has been another issue of investigation. Hesselbrock et al. (1984) suggested that many cases of FH+ alcoholism may have antisocial personality disorder (ASPD). In another study, Hesselbrock, Hesselbrock, and Stabenau (1985) showed that alcoholics with ASPD had an earlier onset of drinking and more social problems than non-ASPD alcoholics. Furthermore, the overlap of some type of alcoholism with sociopathy is suggested by the finding that the attention deficit disorder with hyperactivity (ADD-H) in childhood is related to sociopathy in adult life. Hale, Hesselbrock, and Hesselbrock (1982) pointed out that ADD-H could predict adult antisocial disorder and subsequent alcoholism.

In more detail, Tarter, Laird, Kabene, Bukstein, & Kaminer (1990), studying the relationship between the magnitude of deviation in temperament traits and the severity of substance abuse, found that substance-abusing adolescents could be discriminated from normals on temperament dimensions. Finally, concerning the link between alcoholism and antisocial personality, Cadoret, O'Gorman, Troughton, and Heywood (1985) stated that "alcohol abuse can be regarded as a symptom of antisocial behavior, and some sociopathic behaviors can result from alcohol abuse, but as far as a common etiologic factor is concerned it would appear to be genetic with two types of predisposition, one towards alcohol abuse and the other towards antisocial personality" (p. 162).

In addition to the previously mentioned studies, there is an important body of data on developmental factors in alcoholism. Beardslee, Son, and Vaillant (1986) showed that exposure to alcoholism in the family during childhood was highly correlated with alcohol abuse, alcohol-related legal problems, and sociopathy

later in life. Recently, Barry and Fleming (1990) found that FH+ alcoholics reported significantly less cohesion and expressiveness and more conflicts in their present families than nonalcoholics. Being brought up in an alcoholic family represents a mediating factor that affects how adult offspring of alcoholics function in their present families. In a comprehensive review of the literature, Liepman, White, and Nirenberg (1986) listed the main psychological impairments due to negative family environmental factors: poor self-esteem, depression, anxiety disorders, emotional detachment, dependency, social aggression, emotional irritability, external locus of control, psychosomatic illness, impaired reality testing, guilt feelings, poor coping skills, denial of feelings, mistrust of others, and abusive relationships.

For Bennett, Wolin, Reiss, and Teitelbaum (1987), the concept of family ritual represents the core of a theoretical model explaining alcoholism transmission in families. Family rituals are symbolic forms of communication among family members with specific meaning and of a repetitive nature. These rituals contribute to the formation of the "family identity." In a family, the ritual of alcohol consumption could remain distinctive or may become subsumptive in that the behavior of alcohol abuse subsumes the rituals. Thus, the alcoholism is transmitted from parents to offspring by maintaining these rituals. Using an instrument for the assessment of perceived parental rearing, Vrasti et al. (1990) found that, in contrast to a control sample, FH+ alcoholics were brought up in a family atmosphere characterized by "rejection."

When postulating that alcoholism is mostly a "familial" disorder (Goodwin, 1983), it is very important to distinguish between the contributions of biological and cultural factors, in other words, the familial environment.

The objective of this study was to elucidate the frequently described distinction between FH+ alcoholics negative family history and alcoholism FH- by investigating the relative discriminative power of personality traits, dysfunctional attitudes, and perceived parental rearing in alcoholics and normal subjects.

METHODS

Subjects

The clinical sample comprised 83 men who had been psychiatrically treated for alcohol-related problems at Jebel Psychiatric Hospital. All patients were assessed by a senior clinician with a clinical nonstandardized interview and met DSM-III-R diagnostic criteria for alcohol abuse or dependence. Their mean age was 39.5 ($SD = 8.8$) years. In order to obtain a homogenous sample, all alcoholic probands met Feighner et al. (1972) and Schuckit (1978) criteria for primary alcoholism. This implied the exclusion of patients with a history of schizophrenia, mania, hypomania, depressive disorders, personality disorders (i.e., antisocial type), or organic mental syndromes before the onset of the alcohol abuse. Moreover, inclusion in the clinical sample also was based on a minimum score of 10 on the Michigan Alcoholism Screening Test (MAST; Selzer, 1971). The clinical subjects were assessed during the last days of their hospitalization.

The control sample, comprising 129 subjects with a mean age of 29.2 ($SD = 8.5$) years, was drawn at random from the general population and had no history of psychopathology or alcohol abuse.

Ascertainment of Family History (FH) of Alcoholism

The cases of alcoholism with or without FH of alcoholism were ascertained by gathering information from the probands and other significant informants and from medical records. FH of alcoholism was determined according to Penick et al.'s (1978) method by asking or checking whether any first-degree relative had ever had a drinking history of abuse or dependency, medical or legal problems associated with drinking, or previous treatment for alcoholism.

The total sample was divided into two family groups: FH+ ($n = 40$, M age = 38.5, $SD = 8.0$) years with at least one parent or sibling with alcohol abuse or dependence, and FH- ($n = 43$, M age = 40.4, $SD = 9.5$) without drinking problems in parents and/or siblings.

Assessment of Perceived Parental Rearing

The EMBU questionnaire (an acronym of the Swedish "Egna Minnen av Barndoms-Uppfostran") was developed by Perris, Jacobsson, Lindström, von Knorring, and Perris (1980) to assess the memories of perceived parental rearing behavior. The EMBU is an 81-item inventory covering 14 aspects of child-rearing behavior including abusive, depriving, punitive, shaming, rejecting, overprotective, overinvolved, tolerant, affectionate, performance-oriented, guilt-engendering, stimulating, favoring sibling, and favoring subject. Arrindell, Emmelkamp, Brillman, and Monsma (1983) succeeded, through factor analysis in extracting three factors that were shown to be independent of the parent's sex both in clinical and normal samples. Subsequently, Arrindell et al. (1986) found, in a large international study, that the EMBU items rejection, emotional warmth, and overprotection are invariant across cultures, implying their generalizability.

Personality Assessment

The Karolinska Scales of Personality (KSP), a 135-item questionnaire developed by Schalling (1970), was developed with the purpose of operationalizing and measuring constructs defining vulnerability for different forms of psychopathology (Schalling, Asberg, Edman, & Oreland, 1987). The scales showed satisfactory test-retest reliability and internal consistency. The scales of the KSP are regarded as fairly independent of the state of the subject (Perris et al., 1979). The scales of the KSP inventory can be classified into five main groups:

1. Anxiety-related subscales consisting of Somatic Anxiety (reflecting autonomic disturbances and distress), Muscular Tension (tenseness and stiffness, not relaxed), Psychic Anxiety (reflecting high "cortical arousal," worrying, lack of self-confidence), Psychasthenia (negatively related with "subvalidity")

according to Sjöbring), and Inhibition of Aggression (nonassertive, sad, cannot speak up).

2. Extraversion-related scales comprising Impulsiveness (nonplanning, impulsive), Monotony Avoidance (related to Zuckerman's Sensation Seeking Scale, avoiding routine, need for change and action), Detachment (positively related with "superstability" in the Sjöbring model of personality: avoiding involvement in others, withdrawn, "schizoid"). This group of extraversion scales is positively correlated with low-platelet monoamine oxidase activity.
3. Aggressivity-related scales with Indirect Aggression, Verbal Aggression, and Irritability.
4. Hostility-related scales: suspicion and guilt derived from the Buss-Durkee Inventory.
5. Psychopathy versus conformity scales such as Social Desirability (short version of the Marlowe-Crowne Social Desirability Scale) and socialization.

Assessment of Dysfunctional Cognitive Attitudes

The Dysfunctional Attitudes Scale (DAS) is a 40-item self-report questionnaire developed by Weissman and Beck (1978) to measure the cognitive beliefs that are supposed to constitute a cognitive vulnerability to psychopathology (i.e., approval, love, achievement, perfectionism, entitlement, omnipotence, and autonomy). By factor analysis, Hautzinger, Luka, and Trautmann (1989) extracted three factors: (1) Depressogenic Information Processing, (2) Perfectionistic Attitudes, and (3) Self-esteem Depending on Approval from Others.

Statistical Analysis

Mean scores and standard deviations of the different measures were calculated. The comparisons among variables under consideration were analyzed with one-way analyses of variance (ANOVAs). Discriminant analysis was applied to statistically distinguish between the two alcoholic FH subsamples. Wilk's stepwise method was used in order to select the most predictive variables. The statistical analyses were performed using the Statistical Package for Social Science (SPSS) programs.

RESULTS

In Tables 1, 2, and 3, the relatively important variables that differentiate between FH+ alcoholics and FH- alcoholics or normals are presented. Each canonical function is highly significant ($r_1 = .62$, $r_2 = .59$, $r_3 = .67$, $p < .0001$). Accuracy of prediction by means of canonical discriminant function is also high, varied between 76% and 87%.

Table 1. Discrimination of Two FH Subgroups of Alcoholics by Means of Karolinska Scales of Personality, Dysfunctional Attitudes Scale, and EMBU

Weight	Variables	FH+ Alcoholics M (SD)	FH- Alcoholics M (SD)	F
+1.48	DAS Total Score	159.7 (21.5)	143.3 (21.7)	12.0***
+0.66	Somatic Anxiety (KSP)	26.6 (3.7)	23.6 (3.7)	13.3***
+0.51	Detachment (KSP)	25.0 (3.7)	23.3 (3.8)	3.7*
+0.41	Socialization (KSP)	52.2 (6.9)	54.3 (8.1)	1.4
+0.40	Paternal Rejection (EMBU)	46.8 (10.2)	42.8 (9.8)	3.3
+0.36	Impulsiveness (KSP)	24.5 (2.8)	22.7 (3.7)	6.0**
+0.35	Psychic Anxiety (KSP)	23.1 (6.1)	19.7 (5.2)	6.9**
-0.67	Self-esteem Depending on Others (DAS)	34.1 (9.1)	29.8 (8.2)	5.2*
-0.78	Depressogenic Information Processing (DAS)	42.8 (9.6)	38.5 (10.1)	3.7*

Note. Eigenvalue = 0.64, Wilks λ = 0.60, $\chi^2(10, N = 83) = 37.95$. Fraction of grouped cases correctly classified by means of canonical discriminant function = 76%.

* $p < .05$. ** $p < .001$. *** $p < .0009$. **** $p < .0005$.

FH+ Versus FH- Alcoholics

The most powerful variables in this comparison were the total score of DAS, and the Self-Esteem Depending on Approval of Others and the Depressogenic Information Processing factors of the DAS, Somatic Anxiety, Detachment, Socialization, Impulsiveness, and Psychic Anxiety subscales of the KSP and paternal rejection from the EMBU.

The higher scores obtained on the DAS by FH+ alcoholics could be explained by their increasing susceptibility to depression and loss of self-esteem compared

Table 2. Discrimination of FH+ Alcoholics From Healthy Subjects by Means of Karolinska Scales of Personality, Dysfunctional Attitudes Scale, and EMBU

Weight	Variables	FH+ Alcoholics M (SD)	Healthy Controls M (SD)	F
+0.58	Muscular Tension (KSP)	22.1 (5.9)	15.9 (3.8)	58.9**
+0.56	Depressogenic Information Processing (DAS)	42.8 (9.6)	32.5 (9.9)	32.5**
+0.56	Self-esteem Depending on Others (DAS)	34.1 (9.1)	27.1 (8.0)	22.1**
+0.50	Paternal Rejection (EMBU)	46.8 (10.2)	38.8 (8.3)	25.0**
+0.50	Verbal Aggression (KSP)	13.0 (2.0)	11.9 (2.1)	7.9*
-0.31	Maternal Rejection (EMBU)	46.9 (11.7)	42.0 (8.9)	7.8*
-0.45	Socialization (KSP)	52.2 (6.9)	59.8 (6.1)	42.5**
-0.54	DAS Total Score	159.7 (21.5)	139.9 (26.5)	18.5**
-0.65	Indirect Aggression (KSP)	11.3 (2.5)	10.6 (2.4)	2.9

Note. Eigenvalue = 0.85; Wilks λ = 0.54; $\chi^2(10, N = 83) = 99.7$. Fraction of grouped cases correctly classified by means of canonical discriminant function = 87%.

* $p < .005$. ** $p = .0005$.

Table 3. Discrimination of FH- Alcoholics and Healthy Subjects by Means of Karolinska Scales of Personality, Dysfunctional Attitudes Scale, and EMBU

Weight	Variables	FH- Alcoholics <i>M (SD)</i>	Healthy Controls <i>M (SD)</i>	<i>F</i>
+1.02	Depressogenic Information Processing (DAS)	38.5 (10.1)	32.5 (10.0)	11.6**
+0.83	Muscular Tension (KSP)	18.6 (4.5)	15.9 (3.8)	15.1***
+0.68	Paternal Rejection (EMBU)	42.8 (9.8)	38.8 (8.3)	6.6*
+0.40	Irritability (KSP)	11.3 (2.5)	10.6 (2.3)	3.1
-0.47	Maternal Rejection (EMBU)	42.7 (8.8)	42.0 (8.9)	0.23
-0.59	Psychic Anxiety (KSP)	23.6 (3.7)	24.6 (3.8)	2.0
-0.64	Indirect Aggression (KSP)	10.2 (2.5)	10.6 (2.4)	0.54
-0.77	Perfectionistic Attitudes (DAS)	56.7 (12.7)	56.5 (13.2)	0.00

Note. Eigenvalue = 0.53; Wilks λ = 0.64; $\chi^2(11, N = 212) = 70.64$. Fraction of grouped cases correctly classified by means of canonical discriminant function = 83%.

* $p < .01$. ** $p < .001$. *** $p < .0001$.

to FH- alcoholics. The inclination to develop specific cognitive schemata could be based on particular neurogenetic mechanisms as suggested by Cloninger (1987). Consequently, it is not surprising to find more cognitive dysfunctional attitudes in FH+ alcoholics than in others. In addition, Tarter, Alterman, and Edwards (1985), describing specific temperamental characteristics in alcoholics as being inherited as well, mentioned the high level of emotionability and soothability that could sustain this kind of cognitive vulnerability.

Regarding KSP scores, FH+ alcoholics reported a higher level of anxiety, impulsivity, and coldness and a low level of social conformity. Sandahl, Lindberg, and Bergman (1987) reported the same results, comparing alcoholics with an unfavorable outcome to those with a favorable outcome, the former scoring higher on anxiety and impulsivity, and lower on socialization than the latter.

Our result of a high score on the Impulsivity subscale of KSP in FH+ alcoholics might be related to low level of platelet monoamine oxidase activity, also under genetic control, a very reliable marker for psychopathology in general and for alcoholism in particular (Oreland, von Knorring, & Bohman, 1985). As much as 76% of the subjects could be correctly classified by means of DAS, KSP, and EMBU.

FH+ Alcoholics Versus Controls

As before, FH+ alcoholics scored higher on the total score of the DAS, the Self-esteem Depending on Approval of Others and Depressogenic Information Processing factors of the DAS, implying that underlying cognitive factors might be very discriminative features in FH+ alcoholics compared to healthy subjects.

As concerns KSP subscales, the most powerful variables in this discrimination were Muscular tension as an expression of general anxiety, Indirect Aggression, Verbal Aggression, and Socialization. It should be noted that Socialization is the

only subscale of the KSP that discriminates FH+ alcoholics both from FH- alcoholics and from healthy subjects. High scores on aggression subscales and a low score on the socialization subscale are related with psychopathic traits.

These results are in line with Rydelius (1983), who found, by means of the same inventory, a high level of aggressivity and impulsivity in alcoholic patients compared to normal subjects. In our comparison, the EMBU Rejection factor both for fathers and mothers, proved to be useful. By means of the DAS, KSP, and EMBU Scales, 87% of cases could be correctly classified.

FH- Alcoholics Versus Normals

In this discriminant analysis, the most important variables were the Depressogenic Information Processing and the Perfectionistic Attitudes factors of the DAS, Muscular Tension, Irritability, Psychic Anxiety, and Indirect Aggression subscales of the KSP and the paternal and maternal rejection of the EMBU. In line with the other two pairwise comparisons, the underlying cognitive factors retained their discriminative power.

Regarding the personality traits according to the KSP, the most salient discriminative aspects were Muscular Tension, Indirect Aggression, Psychic Anxiety, and Irritability, reflecting an increased cortical arousal. By means of these DAS, KSP, and EMBU Scales, 83% of the subjects could be correctly classified.

DISCUSSION

In regard to cognitive dysfunctional attitudes, it became obvious that there is a gradual increase of these factors, especially Self-esteem Depending on Others and Depressogenic Information Processing factors, from normals to FH- alcoholics, and finally to FH+ alcoholics. In other words, the cognitive distortions are much more pronounced in alcoholics with a genetic loading. Scrutinizing all discriminative KSP variables emerging in this study, it appeared that the most powerful personality aspects were those related to extraversion (e.g., Impulsiveness, Detachment), to cortical arousal (Psychic Anxiety), or to automatic disturbances (Muscular Tension), related to aggressiveness and psychopathy (lack of socialization).

Parental rearing practices emerged in the discriminative analyses only in terms of paternal and maternal rejection, indicative of punitive, abusive, rejecting, shaming, and depriving attitudes of parents, or implying a form of parental upbringing characterized by physical punishment, rejection of the subject as an individual, hostility, derogation of the subject, and lack of regard for his or her point of view and needs (Arrindell et al., 1983). The mean scores on EMBU paternal and maternal rejection indicated that parents of FH+ alcoholics were more rejecting than others, a finding frequently reported by alcoholics in our clinical work.

In our study, a comparison was made between alcoholics divided by FH in their first-degree relatives. The results support the view that FH+ alcoholics can

be regarded as differing from other alcoholics and from the general population at least by certain personality traits, dysfunctional cognitive attitudes, and particular perceived rearing patterns.

Contrary to our findings, other authors were unable to distinguish among these categories. Comparing a group of male college students who had alcoholic fathers with a group that only had a second-degree alcoholic relative and a group that had no first- or second-degree alcoholic relatives, Alterman and Searles (1989) failed to find significant group differences with respect to drinking behavior, personality, cognitive functioning, and alcohol-related symptoms or consequences. When comparing 32 nonalcoholic FH+ young men with a matched control sample, Morrison and Schuckit (1983) and Schuckit (1983b) did not obtain significant differences using the Eysenck Personality Inventory. More recently, Nirenberg, Liepman, Begin, Maisto, and Lieberman, (1990) failed to distinguish between male alcoholics divided according to family history when assessing locus of control, state and trait anxiety, irrational beliefs, and expectancies about alcohol consumption.

Obviously, it is very difficult to integrate such conflicting data. According to Hesselbrock (1986), a number of methodological issues, which could bias these kinds of results, should be addressed: the index case identification (random sampling vs. patient population); the presence of multiple diagnoses in the proband, the method of determination of the psychiatric status of the individual family members (history methods vs. direct interview); and age of the proband and family members, both being important determinants of the validity and reliability of the information collected. In addition, Nirenberg et al. (1990) regarded the "age window of exposure to the actively drinking alcoholic parent" (p. 1200) as an important methodological factor to take into account and, finally, they asked why some children became more resilient than others in the same alcoholic family. In an extensive and very important article, Reiss, Plomin, and Hetherington (1991) analyzed "how the genetic data are among the best data we have, supporting the importance of environmental mechanisms in both normal and pathological development. Even more intriguing, these genetic data are yielding a clear picture of the types of environmental effects likely to be most important" (p. 284). It became evident that siblings were exposed to different influences during their development, termed "nonshared environmental effects." Nonshared environmental factors may play an important role relatively early in the development of vulnerability or resilience.

This brings us to the fundamental issue regarding psychopathology in general and alcoholism in particular, that is, to find the major influential interactions between gene and environment in the pathogenesis as well as in the formation of normal behavior.

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