0145-6008/92/1601-0068$3.00/0
ALCOHOLISM: CLINICAL AND EXPERIMENTAL RESEARCH

Vol. 16, No. 1
January/February 1992

The Tridimensional Personality Questionnaire in Males at High and Low Risk for Alcoholism

Rocco M. Zaninelli, Bernice Porjesz, and Henri Begleiter

Cloninger has proposed a tridimensional model as the basis for the classification of personality variants and has developed the Tridimensional Personality Questionnaire (TPQ) as an empirical test of this model. In this study, the TPQ was administered to two groups of young men. One group was comprised of nonalcoholic sons of male alcoholics; the other group consisted of nonalcoholic men with no family history of alcoholism. Since the sons of male alcoholics are considered to be at greater risk to develop alcoholism than the sons of nonalcoholics, it was hypothesized that the two groups would demonstrate differences with regard to one or more personality variants as measured by the TPQ. No statistically significant differences in the three TPQ-subscale scores of the two groups were found.

Key Words: TPQ, Risk for Alcoholism.

CLONINGER[1,2] has hypothesized that there are "three dimensions of personality that are genetically independent and that have predictable patterns of interaction in their adaptive responses to specific classes of environmental stimuli." He has termed these three dimensions novelty seeking, harm avoidance, and reward dependence. Cloninger asserts that the genetic variation in each dimension follows a normal distribution, whereby most individuals would have intermediate values; extreme variation along one or more of these dimensions would be expressed as a personality or other disorder. The Tridimensional Personality Questionnaire (TPQ)[3] was developed by Cloninger as a means to provide rapid assessment of individual variation in the three basic dimensions. The individual items were designed to address each dimension separately, the assumption being that each question evaluates the behavior of individuals deviant on one dimension but average on the other two.[1]

More relevant to the present study, however, are the efforts of Cloninger and his co-workers to apply the tridimensional personality model to the investigation of the etiology of alcoholism.[4-6] In particular, the follow-up evaluation of 233 males and 198 females 16 years after an initial behavioral assessment at age 11 indicated that each of the three dimensions was predictive of later alcohol abuse; the results of this study demonstrate an association between deviations from the mean of each of the personality dimensions and an exponential increase in the risk of later alcohol abuse.[4] More specifically, high novelty-seeking and low harm-avoidance values were most strongly predictive of early-onset, male-restricted (type 2) alcoholism, whereas late-onset alcoholism (type 1) is characterized by high harm avoidance and reward dependence and low novelty seeking. Thus, from the review of Cloninger's theoretical formulations and empirical findings, we were led to consider using the TPQ in defining the personality profiles of individuals who appear to differ in their risk for alcohol abuse, the hypothesis being that those individuals who on the basis of positive family history may be at greater risk to abuse alcohol will demonstrate TPQ scores significantly different from those of individuals with a negative family history. The present study serves to test this hypothesis.

METHODS

The 100-item TPQ was administered to two groups of 25 men each. The assignment of an individual to one of the two groups was based on the presence/absence of alcohol dependence in the biologic father as determined by DSM III-R criteria. The subjects with positive family histories were recruited largely from treatment facilities in New York City where their fathers were in treatment for alcoholism, while controls were either medical students at Downstate Medical Center or were recruited from newspaper ads. In all cases, a standardized screening questionnaire covering the alcohol, drug, medical and psychiatric histories of the subjects themselves and their first- and second-degree relatives was mailed to prospective subjects and returned. In addition, upon arrival in the laboratory, each prospective subject was given an extensive clinical interview by an experienced psychiatrist. In order to avoid possibly confounding variables, individuals with a past or current history of medical or psychiatric illness were excluded from the study, as were the sons of female alcoholics. In the (high-risk) group of sons of male alcoholics (SOMAs), all the subjects except one had at least one alcoholic first- or second-degree relative in addition to the biologic father (mean 3.7, SD 1.9). Among the members of the second (low-risk) group, there were no alcoholic first- or second-degree relatives.

RESULTS

The two groups obtained by the above method were compared with respect to age, years of formal education, and alcohol consumption. Alcohol consumption was measured by requesting each subject to state the number of drinking occasions (days) per month as well as the number of drinks consumed per occasion. As shown in Table 1, the average age of the high and low risk groups is

From the Neurodynamics Laboratory, Department of Psychiatry, State University of New York, Health Science Center, Brooklyn, New York.

Received for publication March 27, 1991; accepted August 1, 1991

This work was supported by Grants AA-05524 and AA-02686 of the National Institute on Alcoholism and Alcohol Abuse.

Reprint requests: B. Porjesz, Neurodynamics Laboratory, Department of Psychiatry, Health Science Center, 450 Clarkson Avenue, Brooklyn, NY 11203.

Table 1. Comparison of High- and Low-Risk Groups with Respect to Age, Years of Formal Education, and Alcohol Consumption.

Variable	Group	Mean	SD
Age	Low	22.7	3.2
(years)	High	22.6	3.2
Education	Low	16.1	2.7
(years)*	High	13.5	1.9
Drinks per occasion	Low	2.3	1.1
	High	3.8	3.2
Occasions per month	Low	3.6	3.1
	High	8.0	9.2

Data for the first two variables were compared using the Student's t test, for the last two using the Wilcoxon (Rank Sum) test. For both groups, $n = 25$.

* Significant difference ($p < 0.001$).

Table 2. Comparison of the TPQ Scores of the High- and Low-Risk Groups (Student's t test).

Subscale	Group	Mean	SD	2-Tail probability
Novelty seeking	Low	17.60	4.12	0.240
	High	15.92	5.72	
Harm avoidance	Low	8.32	4.59	0.400
	High	9.52	5.36	
Reward dependence	Low	20.68	4.98	0.957
	High	20.60	5.33	

For both groups, $n = 25$.

nearly identical. In contrast, there is an apparent difference in the mean educational experience of the two groups, and the Student's t test shows this difference to be highly significant ($p < 0.001$). The average number of drinks per occasion was lower for the low-risk group than for the high-risk group, and the average number of drinking occasions per month was greater for the latter as compared to the former group. However, the statistical analysis of these data is less straightforward, because in the high-risk group the distribution of drinks/occasion and occasions/month is skewed towards the extremes. This is especially the case for the number of drinking occasions per month: among the 25 SOMAs, there were five total abstainers (compared with none in the low-risk group) and four individuals who drank on 20 or more occasions per month, suggesting a bimodal distribution. For this reason, the alcohol-consumption data was determined by using a nonparametric test, the Wilcoxon (Rank Sum) Test. With this test, no significant difference could be demonstrated between the alcohol-consumption behavior of the high and low risk groups.

In order to compare the TPQ scores of the high and low risk subjects, the Student's t test was carried out for the three major subscales of the TPQ. In no case was there a significant difference in the mean scores of the high and low risk groups, nor can it be said that a tendency toward significance was demonstrated for any case (Table 2).

DISCUSSION

The purpose of this study was to test the hypothesis that, as measured by the Tridimensional Personality Questionnaire, the sons of male alcoholics would on the whole demonstrate a different configuration of the three personality traits than that evidenced by the sons of nonalcoholic fathers. Given the absence of statistically significant differences in the subscale scores of the two groups, this hypothesis could not be confirmed. One reason may be that the sample size in this study was too small; however, the fact that the results of the Student's t test do not indicate even a tendency toward significance would seem to discount this possibility. The small sample size does complicate the analysis of possible differences among subgroups of the SOMAs, making it difficult, for example, to verify a bimodal distribution of drinking behavior. Possible sample bias is another problem: in comparing the mean TPQ scores for the three subscales in this study with those in Cloninger's original TPQ test group of 101 medical students,[2] one observes that the mean TPQ score for the novelty-seeking subscale is lower in the sample comprised only of medical students than in the low-risk (control) group of this study, which was comprised to a large extent of respondents to a newspaper advertisement (12.9, SD 4.6, vs. 17.6, SD 4.1). This raises the possibility that the low-risk (control) sample selection in this study was skewed toward "novelty seekers" and that this bias offsets the possible presence of novelty seeking in the high-risk group, where an association would be expected.[5,9] However, Peterson et al.,[7] in their extensive statistical analysis of TPQ scores obtained from high and low-risk samples of young men, employed two control groups, one consisting only of 2nd-year psychology students ($n = 21$), the other of respondents to newspaper advertisements ($n = 25$), and they found no significant difference in the TPQ scores of the two groups. This finding would appear to discount sample bias towards novelty-seeking controls as an explanation for the results of this study, which, in general, confirm the findings described in the recent literature.[7–10]

As in this study, Peterson et al. found no significant differences between the TPQ scores of the control groups and the scores of two (one multigenerational and one unigenerational, both $n = 25$) high-risk groups.[7] Likewise, when Schuckit et al.[8] administered the TPQ to 33 SOMA's and 33 well-matched controls, no significant differences between the TPQ scores of the two groups was obtained, nor were consistent trends in the predicted direction evident. In their discussion, Peterson et al. suggest that the apparent inability of the TPQ to distinguish high from low-risk individuals could indicate that persons at increased risk for alcoholism may not actually differ from those at low risk with respect to the traits purportedly assessed by the TPQ. However, as Peterson et al. point out, this argument runs counter to empirical evidence that extreme deviations from the mean of any of the three personality dimensions, but especially novelty seeking, are associated with an increased risk of alcohol abuse.[5,6,11] Thus, if one accepts the assumption that certain consistently described behaviors (personality traits) are associated with the increased risk of developing alcoholism, then the problem would appear to lie in the appropriate "transla-

tion" of these descriptions into a standardized assessment tool such as the TPQ. Other recent work appears to go even further in questioning the validity of the TPQ: after applying the TPQ to a population of alcoholics and other substance abusers, Nixon and Parsons[10] could not confirm the prediction that the TPQ distinguishes between type I (low NS, high HA) and type II (high NS, low HA) alcoholics. Nixon and Parsons indicate that it is not possible at present to know whether their finding reveals problems in the TPQ alone or in the basic assumptions that underlie Cloninger's typologies. More specifically, Schuckit et al. have concluded that not only does the TPQ not help to distinguish individuals assumed at risk for type 2 alcoholism, but also that the "prototypic" type 2 alcoholic (higher level of novelty seeking, lower levels of harm avoidance and reward dependence) is more appropriately described as having antisocial personality disorder. These conclusions are based on the results of the TPQ study cited above as well as on the work by Schuckit et al.[8] and Irwin et al.[11] showing that type 2 characteristics (excluding early age of onset, which is not specific to Cloninger's typology) were not associated with alcohol, other substance abuse, or childhood criminality histories. Nonetheless, since it appears from the literature that the TPQ has yet to be applied to large populations of high- and low-risk individuals, it would be premature to discard a potentially useful instrument—or the theoretical construct on which it is based—without further clarification, testing and modification.

ACKNOWLEDGMENTS

The authors would like to thank Arthur Stimus, Howard Cohen, Guowang Zhang, and John Odencrantz of the Neurodynamics Laboratory, SUNY Health Science Center, for their invaluable technical assistance.

REFERENCES

1. Cloninger CR: A systematic method for clinical description and classification of personality variants. Arch Gen Psychiatry 44:573–588, 1987

2. Cloninger CR: A unified biosocial theory of personality and its role in the development of anxiety states. Psychiatr Dev 6(2):83–120, 1988

3. Cloninger CR: Tridimensional Personality Questionnaire, Version 4. Unpublished manuscript, copyrighted 1987

4. Cloninger CR, Sigvardsson S, Bohman M: Childhood personality predicts alcohol abuse in young adults. Alcohol Clin Exp Res 12:494–505, 1988

5. Cloninger CR, Sigvardsson S, Gilligan SB, von Knorring AL, Reich T, Bohman M: Genetic heterogeneity and the classification of alcoholism. Adv Alcohol Subst Abuse 7:3–16, 1988

6. Cloninger CR: Neurogenetic adaptive mechanisms in alcoholism. Science 236:410–416, 1987

7. Peterson JB, Finn PR, Wiener D, Earlywine M, Pihl RO: The tridimensional personality questionnaire and the inherited risk for alcoholism. Unpublished manuscript, 1990

8. Schuckit MA, Irwin M, Mahler HIM: Tridimensional Personality Questionnaire Scores of Sons of Alcoholic and Nonalcoholic Fathers. Am J Psychiatry 147(4):481–487, 1990

9. von Knorring L, von Knorring AL, Smigan L, Linberg U, Edholm M: Personality traits in subtypes of alcoholics. J Stud Alcohol 48:523–527, 1987

10. Nixon SJ, Parsons DA: Application of the Tridimensional Personality Questionnaire to a population of alcoholics and other substance abusers. Alcohol Clin Exp Res 14:513–517, 1990

11. Irwin M, Schuckit M, Smith T: Clinical Importance of age of onset in type 1 and type 2 primary alcoholics. Arch Gen Psychiatry 47:320–324, 1990