

THIRTY YEARS OF USING A SERIES OF PERSONALITY QUESTIONNAIRES CONSTRUCTED BY COMPUTER

Aleksandar Momirović, Helena Gjurić & Martina Goluban

Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

SUMMARY

Background: The series of personality questionnaires constructed using a computer was created on the basis of cybernetic theories of personality, which presupposes the existence of six conative control systems: a system for the regulation of defense responses, a system for the regulation of attack responses, a system for controlling physiological functions, a system for coordination of regulatory functions, system for integration of regulatory functions and system for regulation of activity. Six personality questionnaires measure the intensity of the following pathological personality tendencies: 1. neurasthenia and anxiety, 2. aggressiveness and impulsiveness, 3. conversive neurotic disorders, 4. psychotic dissociation, 5. psychotic regression and 6. extroversion-introversion.

Subjects and methods: The sample consisted of 4368 persons: 3496 subjects without a diagnosis, and 872 patients with a psychiatric diagnosis. Participants had to fill in the six personality questionnaire. Data were collected anonymously, during psychological treatment at the Neuropsychiatric Hospital "Dr. Ivan Barbot" in Popovača, at the Department of Occupational Medicine and Transport and the Department of Mental Health and Addiction Prevention at Dr. Andrija Stampar Institute of Public Health and for the purpose of selection of candidates for employment in the period from 1984 until today. Basic metric characteristics were determined for all scales. Factor structure of the scales was determined using principal component analysis; as canonical discriminant analysis, polar taxons analysis and canonical correlation analysis are special cases of factor analysis, results of factor analysis were used for further processing.

Results: Results from earlier studies are replicated on much larger sample: metric characteristics of scales are very good, as in previous studies, similar structure of polar taxons was found and discrimination between healthy subjects and those with psychiatric diagnoses was successful. Canonical correlation analysis showed interconnection of reactions on certain scales and extremely complex relationship between them which indirectly confirms the theoretical model on the basis of which the scales are formed.

Conclusions: The usefulness of this scales is confirmed in clinical setting and in selection of candidates for employment.

Key words: cybernetic personality theory - personality questionnaires- multivariate analysis

* * * * *

INTRODUCTION

Cybernetic theory of personality, emerged in the Faculty of Kinesiology (Momirović et al. 1982, Momirović & Ignjatović 1977), assumes the existence of a finite number of conative control systems, which are responsible for human adaptation to the environment. The adjustment is done by changing behavior, which responds to specific external conditions.

Conative control systems are specialized, each of which responds to certain environmental conditions and produces a certain type of reaction, which is evident in the behavior of people. Conative regulatory systems are hierarchically organized; some of them are superior to others, whereby the control range is greater for higher-level control system. Conative regulatory systems are interconnected by unidirectional, bidirectional and complex relationships. The intensity of the reactions of each controller is different, from barely noticeable to very strong reactions. Conative regulatory systems and cognitive mechanisms are at a healthy personality structure slightly positively correlated, but the dysfunction of conative regulators provokes a negative and significant impact on cognitive mechanisms.

The cybernetic personality theory assumes that conative regulation systems almost completely describe

the structure of personality and explain each mode of behavior. In doing so, there is no dichotomy between normal and pathologic characteristics; they differ only in intensity (if the intensity is too high, the reaction is unadjusted to the environment).

The cybernetic personality theory assumes that there are six conative control systems:

- A system for the regulation of defense responses (Alpha) reacts to situations of threat, controls escape or blocks movement; it is associated with feelings of fear and in the case of dysfunction asthenic occurs neurotic syndrome (anxiety, obsession, compulsivity, phobia, hypersensitivity).
- A system for controlling attack reactions (Sigma) reacts to the situation of distractions or obstacles, the reaction is physical or verbal assault; it is associated with a sense of anger and in the case of dysfunction occurs stenic neurotic syndrome (aggressiveness, impulsivity).
- A system for the regulation of organ functions (Chi) reacts to body violation possibility, reactions are protective, avoiding pain or fatigue; dysfunction causes the formation of somatization or conversive neurotic reaction.

- A system for coordinating regulatory functions (Delta) coordinates the work of conitive, cognitive and motor controller; it provides adequate response and it is superior to most other systems; in case of dysfunction occur psychotic manifestations – paranoia, schizophrenia, loss of connection with reality.
- A system for integration of regulatory functions (Eta) ensures the functioning of a person in a social environment, regulates behavior in accordance with social regulations, in the case of dysfunction, occur psychotic (if coordinating system dysfunction is present too) or psychopathic (if the system for controlling attack reaction is also dysfunctional) symptoms.
- A system for the activity regulation (Epsilon) regulates the sleep-wake state, concentration and activity level; in case of dysfunction occur abulic or depressive symptoms (if the system for coordinating regulatory functions is present to). Manic disorder appears in the case of hyperactivity.

The aim of the work is a replication of the already well-known studies (Prot & Momirović 1984, Momirović 1988, Momirović 1989) on the far larger sample.

SUBJECT AND METHODS

Subjects

The sample consisted of 4368 persons: 3496 subjects without a diagnosis, and 872 patients with a psychiatric diagnosis, of which 261 psychoses, 283 with unspecified disorder (category in obs.), 28 alcoholics, 26 borderline personality disorder, 23 epilepsy, 13 patients with so-called. nuclear neurosis, 104 neuroses, 26 drug addicts, 15 patients with organic personality disorder, 63 patients with posttraumatic stress disorder and 30 patients with antisocial personality disorder. Data were collected anonymously, names of subjects were not recorded, only diagnostic category.

Methods

A series of personality questionnaires constructed by computer was created on the basis of cybernetic theories of personality. It consists of six scales with 30 items:

- Alpha Scale, which measures the intensity of interference from the circle of neurotic asthenia;
- Sigma Scale, which measures the intensity of aggressive and impulsive reactions;
- Chi scale, which measures the intensity of conver-sive and psychosomatic neurotic reactions;
- Delta scale, which measures the intensity of psychotic dissociation;
- Eta Scale, which measures the intensity of regression;
- Epsilon scale, which measures th;
- e intensity of the general activity.

Data were collected during psychological treatment at the Neuropsychiatric Hospital "Dr. Ivan Barbot" in Popovača, at the Department of Occupational Medicine and Transport and the Department of Mental Health and Addiction Prevention at Dr. Andrija Štampar Institute of Public Health and for the purpose of selection of candidates for employment in the period from 1984 until today.

Statistical analyses

Basic metric characteristics were determined for all scales (Momirović 1983). The factor structure of the scales was determined using principal component analysis; as canonical discriminant analysis, polar taxons analysis and canonical correlation analysis are special cases of factor analysis, results of factor analysis were used for further processing.

RESULTS

Results from this study are extremely extensive. For that reason, here are listed partially. Complete results are available at Dr. Andrija Štampar Institute of Public Health in Zagreb.

From basic metric characteristics of the scales we will list their reliability expressed as Kuder-Richardson coefficients of internal consistency in table 1.

Table 1. Reliability coefficient (Kuder-Richardson)

Scale	Coefficient
Scale Alpha	0.938
Scale Sigma	0.929
Scale Chi	0.956
Scale Delta	0.965
Scale Eta	0.950
Scale Epsilon	0.943

As can be seen, scales are highly reliable. There are also high coefficients of homogeneity and discrimination of individual items.

Taxonomic analysis of polar taxons substantially replicated taxonomic dimensions from earlier study (Table 2).

Table 2. Polar taxons

I	general psychopathology
II	primary aggressiveness
III	neuroticism
IV	neurasthenia
V	hysterical regression
VI	regression

Table 3. Means of groups (standardized values)

Diagnosis		Alpha	Sigma	Chi	Delta	Eta	Epsilon
Without diagnosis	ND	0.26	0.17	0.30	0.31	0.27	-0.20
Alcoholism	AL	-0.94	-0.67	-1.04	-1.20	-0.74	0.95
Borderline Personality Disorder	BP	-1.77	-1.03	-2.14	-2.14	-1.87	1.43
Epilepsy	EP	-1.04	-0.88	-1.52	-1.46	-1.37	0.80
No specified, „In Obs.“	IO	-0.65	-0.54	-0.71	-0.70	-0.63	0.41
Neurosis nuclearis	NN	-2.16	-1.54	-2.42	-2.01	-2.26	1.38
Neurosis	NE	-0.94	-0.53	-1.10	-0.91	-0.78	0.58
Drug addiction	DA	-0.53	-0.81	-0.76	-0.78	-0.56	0.57
Organic disorder	OD	-0.85	-0.26	-0.53	-0.57	-0.30	0.63
Post-Traumatic Stress Disorder	PT	-1.11	-0.96	-1.45	-1.69	-1.37	1.47
Sociopaths	SC	-0.79	-1.31	-0.89	-1.15	-1.12	0.13
Psychosis	PS	-1.47	-0.70	-1.71	-1.75	-1.60	1.13

It is interesting to note that the fifth taxonomic dimension was identified as hysterical dissociation in earlier study, which often recalls the opinion of one of the authors (Momirović 1995) of cybernetic theory of personality on the absence of Eta factor (i.e. conative regulation system for integration of regulatory functions). Eta factor does not appear in all researches for the simple reason that many studies were conducted on a sample of soldiers and it is well known that each recruitment process in any army in the world is focused on the elimination of individuals who cast doubt on the military subordination, i.e. obedience to superiors. It is logical that in such samples, there are few people who fall under the diagnosis „antisocial personality disorder“, or as it is usually called: psychopathy (or sociopathy), and as required by the cybernetic theory of personality, dysfunction conative system for integration of regulatory functions (Eta) is one of the causes of the so-called sociopathic ways of responding (lack of empathy, disregard for authority, individualism, aggression).

Canonical discriminant analysis revealed significant differences among examined groups and the highest between subjects without any diagnosis and other groups. It is interesting to note that the nature of these differences is such that allows the use of these personality questionnaires as screening instruments: in practice, subjects with any diagnosis at first sight react very differently from those without psychiatric diagnosis and this is evident even in the simplest possible method of calculating the total score, i.e. in plain addition of numerical values associated with individual response (here are listed standardized, Z-values) (Table 3).

Four significant discriminative dimensions were found in canonical discriminant analysis, where the first one represents so-called general pathology dimension, second one is defined by aggressive reactions, third one differs patients diagnosed with so-called major personality disorders (psychosis, neurosis nuclearis, borderline personality disorder) from all others – this dimension is bipolar (neuroticism vs psychoticism) and fourth differs subjects with so-called sociopathic personality disorder from all others (Table 4, Table 5, Table 6).

Table 4. Structure of discriminant dimensions

	D 1	D 2	D 3	D 4
Alpha	0.796	-0.077	0.209	0.311
Sigma	0.490	0.637	0.266	0.470
Chi	0.933	0.008	0.119	0.320
Delta	0.945	0.202	-0.105	0.100
Eta	0.841	0.118	-0.230	0.431
Epsilon	-0.625	-0.095	0.014	0.537

Table 5. Group centroids in discriminant space

	D 1	D 2	D 3	D 4
ND	0.254	-0.126	-0.127	-0.019
AL	-0.860	0.528	0.463	-0.166
BP	-1.702	0.967	1.049	0.137
EP	-1.121	0.865	0.445	0.302
IO	-0.655	0.217	0.160	0.051
NN	-2.184	0.553	0.810	0.163
NE	-0.891	0.194	0.486	0.064
DA	-0.615	0.475	-0.060	-0.046
OD	-0.654	-0.222	0.480	-0.329
PT	-1.117	1.126	0.663	-0.186
SC	-0.983	0.544	-0.495	0.498
PS	-1.383	0.753	0.978	0.158

Table 6. Canonical correlation coefficients

	Sigma	Chi	Delta	Eta	Epsilon
Alpha	0.74	0.79	0.72	0.77	0.61
Sigma		0.76	0.72	0.74	0.64
Chi			0.85	0.86	0.57
Delta				0.86	0.56
Eta					0.59

DISCUSSION

Canonical correlation coefficients between the scores on the individual scales are medium high. It is particularly interesting structure and number (on average about 10) of significant canonical correlation factors which implies an extremely complex relationship between reactions at all scales. It is a result which indirectly confirms extremely complex relationship of conative regulatory systems which is foreseen by cybernetic theory of personality, on the basis of which are incurred these measuring instruments.

CONCLUSIONS

Results from earlier studies are replicated on a much larger sample:

- Metric characteristics of scales are very good, as in previous studies;
- Similar structure of polar taxons was found;
- Discrimination between healthy subjects and those with psychiatric diagnoses was successful.

Canonical correlation analysis showed interconnection of reactions on certain scales and extremely complex relationship between them which indirectly confirms the theoretical model on the basis of which the scales are formed.

The usefulness of this scales is confirmed in the clinical setting and in the selection of candidates for employment.

Acknowledgements: None.

Conflict of interest : None to declare.

References

1. Momirović A: Algorithm and program for the determination of some metric characteristics of cognitive psychological tests. In *Proceedings of 5th international symposium "Computer at the University"*, Cavtat, 1983.
2. Momirović A: Psihometrijske karakteristike upitnika ličnosti konstruiranog pomoću kompjutera u uzorku hospitaliziranih duševnih bolesnika. *Primijenjena psihologija* 1988; 9:45-48.
3. Momirović A: Taksonomska analiza upitnika ličnosti konstruiranih pomoću računala u uzorku kandidata za vozače motornih vozila. *Primijenjena psihologija* 1989; 10:299-304.
4. Momirović K & Ignjatović I: Struktura konativnih faktora. *Psihologija* 1977; 10:25-32.
5. Momirović K, Horga S & Bosnar K: Prilog formiranju jednog kibernetičkog modela strukture konativnih faktora. *Kineziologija* 1982; 14:83-108.
6. Momirović K: Kraj jednog mita: još jedan dokaz da ne postoji faktor eta. *Časopis za kliničku psihologiju i socijalnu patologiju* 1995; 2:69-89.
7. Prot F & Momirović K: Karakteristike jedne baterije mjernih instrumenata za procjenu konativnih faktora konstruiranih pomoću računala. *Čovek i zanimanje* 1984; 4:10-14.

Correspondence:

Aleksandar Momirović, M.A.

Andrija Štampar Teaching Institute of Public Health

Mirogojska cesta 16, 10 000 Zagreb, Croatia

E-mail: aleksandar.momirovic@stampar.hr