



Determination of the Connections between Properties Characterising Psychological Temperaments

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ABSTRACT This study considered the key four kinds of temperaments and the properties determining them. Therefore, the major 15 properties of a person's temperament were distinguished, including stability of the mental state, emotionality, self-esteem, assessment of difficulties, activity, reactivity, and plasticity, the speed of mental reactions, poise, extraversion, excitability, mood stability, adaptation, contact, and reaction to the new. Thus, a property identification questionnaire was provided. Moreover, formulas were proposed to calculate the temperament properties according to the survey results. Then, numerical values of the properties were obtained for each respondent. In addition, the relationships between various properties were investigated. The results were presented in a crosstab. Consequently, five most strongly related to other properties were identified and excluded and a final table of correlation coefficients was given for the remaining 10 properties of temperament. Finally, it was suggested that these signs could successfully classify the type of temperament.

INTRODUCTION

In the modern dynamic and changing world, the issue of the types of personality temperaments in the constantly changing living conditions, and accordingly, adaptation to them, is of particular relevance. In fact, temperament manifests itself in many life situations, for example, in communication within a team, in the process of socio-psychological adaptation, in interaction with the environment, and so forth (Fanaj et al. 2015; Sulis 2018).

This study discussed the main psychological characteristics of the classical types of temperaments, including stability of the mental state, emotionality, self-esteem, assessment of difficulties, activity, reactivity, plasticity, speed of mental reactions, poise, extraversion, excitability, mood stability, adaptation, contact, and reaction to new.

Each person has these signs with different manifestations (Canli 2006; Buss and Hawley 2011; Maltby et al. 2017). Thus, depending on the degree of their manifestation, a certain human psychotype; that is, temperament would be established. Typologies of temperaments are currently quite large. Most often, it is customary to distinguish four temperaments depending on the direction and degree of manifestation of the characteristics such as sanguine, choleric,

phlegmatic, and melancholic features (Strelau 2002; Boag and Tiliopoulos 2011; Zentner and Shiner 2015).

This study intended to identify indicators of relationships for each type of personality temperament. Participants of the study were students of Kazan Federal University. As part of the study, a questionnaire was prepared, and a survey of three different groups of respondents was conducted. In order to administer the Os-nitsky questionnaire (Os-nitsky 2004), the russified Rogers and Diamond questionnaire (Rogers and Dymond 1954) was modified for the goals of the present study. The new questionnaire contains 82 questions with a rating scale of 1 to 6.

Then, a correlation analysis was run for examining the correlation and to identify the duplication signs. However, the so-called basic 10 properties that have a low correlation with each other were left out. According to these grounds, one can successfully classify the type of temperament (Putnam et al. 2019).

Objectives

This study considered the key four kinds of temperaments and the properties determining them and discussed the main psychological characteristics of the classical types of temperaments.

METHODOLOGY

Types of Temperament and Their Characteristics

Temperament is the individual's characteristic on the part of the dynamic characteristics of his mental activity; that is, pace, speed, rhythm, and intensity, which constitute mental processes and conditions.

At its core, temperament is a personality trait, formed on the basis of genetic conditioning such as the nervous system. Actually, temperament reflects the dynamic aspects of behaviour; therefore, temperament has the most stable and constant properties in comparison with other mental characteristics of a person (Shiner 2015; Sperandeo et al. 2016). The most specific feature of temperament is that various properties of the temperament of a given person are not accidentally combined with each other, but are naturally related to each other, forming a certain structure. Therefore, there are four main types of temperament such as sanguine, choleric, phlegmatic, and melancholic (Kushner 2015; Mangan 2016; Kesebir et al. 2019).

In this regard, Pavlov (1951) proposed a theory about the correlation of some common properties of nervous processes with types of temperament. Of course, his theory was experimentally confirmed in the work of followers. According to the theory, there are some of the fundamental properties of nervous processes at the heart of each individual characteristic.

This contributed to the formation of the main properties of temperament:

1. Stability of mental reactions
2. Emotionality (strength and speed of emotions)
3. Self-esteem (self-acceptance)
4. Assessment of difficulties (perception of conflict with the external environment)
5. Activity (how intensively a person acts on the outside world and tries to overcome obstacles)
6. Reactivity (degree of involuntary reactions to external or internal stimuli)
7. Plasticity (how easily and flexibly a person adapts to external influences)
8. Speed of mental reactions (regulation of the dynamics of mental processes and mental activity in general)

9. Poise
10. Extraversion (reactions and human activities are more dependent on external impressions, the external environment as a whole)
11. Excitability
12. Mood stability (stability or variability, smoothness or sharpness of a change in feelings)
13. Adaptation (adoption of a new social environment)
14. Contact (degree of sociability)
15. Reaction to the new (assessment of sudden changes)

If one takes into account all these properties, then one can give the following psychological characteristics of the main types of temperament.

Sanguine: A person characterised by the increased reactivity, but balanced with activity. He also quickly changes his emotions, and he is easily excited. Very energetic, easy to make contact, needs external impressions. Balanced, able to quickly concentrate, disciplined, if desired, can restrain the manifestation of his feelings and involuntary reactions. High plasticity is manifested in the variability of feelings, moods, interests, and aspirations. Sanguine easily converges with new people and quickly gets used to new requirements and surroundings. He has a strong type of nervous system.

Choleric: He is characterised by high reactivity and activity, so that reactivity is pronounced. He is also hot-tempered, easily excitable. Less plastic and more inert than sanguine, difficulties in switching attention are possible, he is more like an extrovert. Choleric are fast, overly mobile, unbalanced, and all mental processes in them proceed quickly and intensively. Feelings of a person of choleric temperament are strong, usually brightly manifested, and quickly arise. In addition, his mood changes dramatically. Choleric is characterised by imbalance. He overcomes difficulties very easily. He can be the instigator of the conflict and needs external impressions.

Phlegmatic Person: He has high activity, significantly prevailing over low reactivity and emotionality. He stays calm with big troubles. With difficulty, he switches his attention and adapts to a new environment, slowly rebuilds

his skills and habits. Differs in balance, endurance and self-control. As a rule, he is difficult to converge with new people, and weakly responds to external impressions.

Melancholic: He has high sensitivity and low reactivity, is overly touchy, painfully sensitive, and emotional. Usually, he is not self-confident, has low self-esteem, and the slightest difficulty forces him to give up. He is inherent in being easily distracted and has unstable attention, the slowed down pace of all mental processes. He is difficult to make contact with the environment. A melancholic adapts for a long time, and the adaptation process is given to him hard.

Properties of Temperament Types

Table 1 provides an approximate assessment of the correspondence of each property to the types of temperaments based on brief characteristics on a five-point scale (from 0 to 5).

Table 1: The approximate ratio of psychological properties and types of temperament

Property/ Temperament type	Cho- leric	Sang- uine	Phleg- matic	Mela- ncho- lic
1. Stability of a mental state	3-4	4-5	4-5	2-3
2. Emotionality	4-5	4-5	1-2	3-4
3. Self-esteem	3-4	4-5	4-5	1-2
4. Assessment of difficulties	3-4	3-4	4-5	1-2
5. Activity	3-4	4-5	3-4	2-3
6. Reactivity	4-5	3-4	1-2	2-3
7. Plasticity	3-4	4-5	1-2	1-2
8. Speed of mental reactions	4-5	4-5	3-4	1-2
9. Poise	1-2	3-4	4-5	2-3
10. Extraversion	3-4	4-5	2-3	2-3
11. Excitability	4-5	4-5	1-2	2-3
12. Mood stability	1-2	2-3	4-5	3-4
13. Adaptation	3-4	4-5	1-2	1-2
14. Contact	3-4	4-5	2-3	2-3
15. Reaction to the new	4-5	4-5	2-3	1-2

According to the Table, the properties overlap. For example, contact follows extraversion, as a person is directed to the environment to receive impressions from the outside. Adaptation at the same time follows the sum of several characteristics, for example, plasticity, extraversion, and stability of the mental state and a posi-

tive reaction to the new. Therefore, some of the properties can be expressed through others.

For example, the internal state directly depends on the level of adaptability, because an adaptable individual feels comfortable at a high level and experiences positive emotions during a decline, and thus mood and performance deteriorate as a whole. It is necessary to consider emotional background of the adaptable at the previous moment in time. If the subject has an unstable nervous system, then his mood, whether positive or negative, will not be able to hold for a long time, and often changes. Moreover, the choleric nervous system is less stable than that of a sanguine, which indicates more frequent and greater differences in the emotional background.

Questionnaire

This study used the methodology for diagnosing socio-psychological adaptation of Rogers-Diamond as the basis, which was developed in 1954. The questionnaire was adapted for Russia in 2004 and contained 101 questions. To administer the questionnaire, the researchers edited the Osnitsky questionnaire. Thus, the researchers reduced the number of questions from 101 to 82, and the rating scale was also changed from 1 to 6. Now, a list of questions is provided here.

1. I feel awkward when I am talking to someone.
2. I don't want others to guess what I am, what is in my soul, and I introduce myself to them, hide my face under a mask.
3. I often feel humiliated.
4. I doubt that I might like someone from the opposite sex.
5. I now have a good relationship with others.
6. I am restrained, withdrawn, keeping a little aloof from everyone.
7. I am a responsible person; you can rely on me.
8. I have a sense of hopelessness, all in vain.
9. I accept most of the rules and requirements that people must follow.
10. I have few personal beliefs and rules.
11. I like to dream sometimes right in the middle of the day.

12. I have the feeling that I am angry with the whole world: I attack everyone, snarl, and do not give anyone a descent. And then, suddenly I'll be 'stuck' on some insults and mentally avenging the offender. It is hard to restrain yourself in such things.
13. I can control myself and my actions. Self-control is not a problem for me.
14. My mood often spoils: suddenly he finds despondency, a spleen.
15. I don't really care about others. I am focused on myself, busy with myself.
16. People tend to like me.
17. I easily, freely, naturally express what I feel.
18. If I find myself among a large number of people, I feel a little lonely.
19. Now I am very uneasy. I want to drop everything, hide somewhere.
20. Usually, I easily get along with others.
21. My hardest battles are with myself.
22. At heart, I am optimistic and believe in the best.
23. I am not malleable. Stubborn. Those like me are called difficult people.
24. I feel that I am not a leader, but a slave: I still do not always manage to think and act independently.
25. Most of those who know me are good to me; they like me.
26. Sometimes I have thoughts that I would not want to share with anyone.
27. I have a beautiful figure; I am attractive.
28. I feel helpless. I need someone to be around.
29. My decisions are not my own. Even when it seems to me that I decide on my own, they are still accepted under the influence of other people.
30. I often feel guilty, even when it is as if I am not guilty of anything.
31. I feel antipathy and hostility to what surrounds me.
32. I am satisfied.
33. I am unsettled: I can't get together, pull myself together, concentrate, and organise myself.
34. I feel lethargy, apathy; everything that used to excite me suddenly became indifferent.
35. I am balanced, calm, and I have an even mood.
36. Angry, I rarely lose my temper.
37. I often feel offended.
38. I am impulsive, impatient, and acting on the first impulse.
39. It happens that I gossip.
40. It is rather difficult to be yourself.
41. I have in the foreground the mind, not the feeling. Before doing something, I think about my actions.
42. I am patient in my attitude towards people and accept everyone as they are.
43. I consider myself an interesting person, noticeable, and attractive as a person.
44. I am shy, easy to stew.
45. I definitely need some kind of reminders, pushing from the outside, to finish the job.
46. I feel an inner superiority over others.
47. I am nobody. There is nothing in which I express myself and show my individuality.
48. I am afraid of what others will think of me.
49. I am ambitious. I am not indifferent to success and praise.
50. I despise myself now.
51. I do not have the courage to face difficulties or a situation that threatens to complicate.
52. I just do not respect myself.
53. I am a leader by nature and know how to influence others.
54. In general, I feel good about myself.
55. I am persistent, assertive, and confident.
56. I do not like when my relationship with someone deteriorates.
57. I am in some confusion. Everything was confused and mixed up with me.
58. I am satisfied with myself.
59. I am a loser. I am not lucky.
60. I am a pleasant, handsome, and disposing person.
61. I like others as a person.
62. When I have to do something, I am seized with fear of the past: what if I can't do it, what if I can't do it.
63. I have an easy calm soul.
64. I can work hard.
65. It happens that I talk about things that I don't understand at all.
66. I am alarmed, worried, and tense.
67. To make me do something, I must insist on it, and I agree, I will surrender.
68. I feel insecure.

69. I am often forced to defend myself and build arguments that justify me, and I will make my actions justified.
70. I am compliant, malleable, and gentle in relations with others.
71. Sometimes, I like to brag.
72. I am hopeless. I make decisions and immediately break them. I despise my impotence, but I cannot help myself. I have no will and no will to work it out.
73. I try to rely on my own strength, not counting on anyone's help.
74. I have a feeling of constraint, of internal lack of freedom.
75. I am different from others.
76. I am not very reliable; you cannot rely on me.
77. Everything is clear to me about myself. I understand myself well.
78. I am a sociable open person. I easily get along with people.
79. My strengths and abilities are fully consistent with the tasks that life sets before me. I can handle everything.
80. They do not take me seriously. To me, at best, condescending. They just put up with me.
81. Usually, I can make a decision and firmly follow it.
82. I feel that I am changing, growing, and growing up. My feelings and attitudes towards others are becoming more mature.

The survey contained statements about a person, his lifestyle, feelings, thoughts, behaviour style, and habits. After reading the questionnaire statements, the respondent needs to relate it to himself and assess the extent to which this statement can be suitable. The following scale was used for evaluation:

- 1: This does not apply to me at all
- 2: I doubt that this can be attributed to me
- 3: I do not dare to attribute this to myself
- 4: It looks like me, but there is no certainty
- 5: It is like me
- 6: It is exactly about me

It should be noted that the questions were added to the questionnaire in order to clarify the respondent's gender, knowledge of languages, and place of birth. In addition, the survey itself was compiled and posted in Russian using a Google Form.

RESULTS AND DISCUSSION

Analysis of the Questionnaire Results

The survey was conducted among students of the Institute of International Relations and the Institute of Computational Mathematics and Information Technologies of Kazan Federal University. Three independent questionnaires were administered:

1. In November 2017, 46 students (65.2% females and 34.8% males) were interviewed from various courses of the Institute of Computational Mathematics and Information Technologies.
2. In April 2018, 72 first-year undergraduate students (73.6% females and 26.4% males) of the Institute of International Relations, studying "foreign regional studies and international relations".
3. In December 2018, 117 second-year undergraduate students (94.0% females and 6.0% males) of the Institute of International Relations, studying the direction of "linguistics".

First of all, it was necessary to understand how the statements in the questionnaire compare with the properties of temperament. Actually, each statement in the survey aimed to identify one or more psychological characteristics.

For example, the researchers considered the statement, "I accept most of the rules and requirements that people must follow". This statement aimed at identifying the degree of adaptation and plasticity, because if the respondent agrees with him, it means the comfort of his sensations in the new environment, or "entry" into the system. Thus, it shows the stability of the mental state.

Therefore, questions determining the values of properties were identified. In other words, coefficients of the relations between properties and questions were asked. Moreover, in order to obtain a total result for any property, it was necessary to multiply the coefficients by the answers chosen by the respondents (values from 1 to 6), and sum them up. Note that the coefficient values varied from -5 to +5.

The formulas for all properties of temperament types are provided here. For example, in order to calculate the value of the first property "Stability of a mental state", it is necessary to

multiply the answer to the third question by -3, multiply the answer to the fifth question by 4, and so forth, and add up all the terms.

Stability of a mental state =

$$\begin{aligned} & -3\{3\} + 4\{5\} + 2\{6\} + 5\{7\} - 3\{8\} + 4\{9\} \\ & - 2\{11\} - 5\{12\} + 4\{13\} - 4\{14\} + 4\{16\} + \\ & 3\{17\} - 4\{19\} + 3\{20\} - 2\{21\} + 5\{22\} + 4\{23\} \\ & + 4\{25\} + 5\{27\} + 2\{29\} - 1\{30\} + 4\{32\} - \\ & 4\{33\} + 5\{35\} - 3\{38\} + 2\{40\} + 5\{41\} + 4\{42\} \\ & + 5\{43\} + 3\{44\} + 3\{46\} + 2\{47\} - 3\{50\} - \\ & 3\{51\} - 4\{52\} + 5\{53\} + 4\{54\} + 5\{55\} + 3\{56\} \\ & - 4\{57\} + 4\{58\} - 3\{59\} + 3\{60\} + 4\{61\} - \\ & 3\{62\} + 4\{63\} + 4\{64\} - 2\{65\} - 3\{66\} - 3\{68\} \\ & + 2\{70\} - 3\{72\} + 3\{73\} - 2\{74\} - 3\{76\} + \\ & 4\{77\} + 2\{78\} + 4\{79\} - 2\{80\} + 4\{81\} + 5\{82\} \end{aligned}$$

$$\begin{aligned} \text{Emotionality} = & -3\{2\} + 4\{3\} + 3\{5\} - 2\{6\} \\ & - 1\{7\} + 3\{8\} - 2\{9\} - 3\{10\} + 4\{11\} + 5\{12\} \\ & + 4\{13\} + 3\{14\} + 2\{16\} + 2\{17\} + 2\{18\} + \\ & 3\{19\} + 4\{20\} + 2\{22\} + 2\{23\} - 1\{24\} + 4\{28\} \\ & + 3\{30\} + 3\{31\} - 1\{32\} - 3\{34\} - 5\{35\} + \\ & 3\{37\} + 5\{38\} - 4\{41\} - 3\{42\} + 3\{44\} + 3\{50\} \\ & + 2\{55\} + 3\{57\} + 4\{59\} + 3\{62\} + 2\{63\} + \\ & 3\{66\} + 3\{68\} + 2\{70\} - 2\{74\} - 2\{77\} + 1\{78\} \\ & - 3\{78\} - 3\{81\} - 3\{82\} \end{aligned}$$

$$\begin{aligned} \text{Self-esteem} = & -3\{1\} - 3\{2\} - 4\{3\} - 4\{4\} + \\ & 4\{5\} + 2\{6\} + 3\{7\} - 5\{8\} - 4\{10\} - 2\{21\} + \\ & 5\{22\} + 3\{23\} - 3\{24\} + 4\{25\} + 5\{27\} + 2\{28\} \\ & - 2\{29\} - 3\{30\} + 2\{31\} + 2\{34\} + 4\{35\} + \\ & 1\{37\} + 2\{39\} + 2\{40\} + 5\{43\} - 2\{44\} + 5\{46\} \\ & - 4\{47\} - 4\{48\} + 4\{49\} - 4\{50\} - 3\{51\} - 5\{52\} \\ & + 5\{53\} + 4\{54\} + 4\{55\} + 2\{57\} + 4\{58\} - \\ & 3\{59\} + 4\{60\} + 4\{61\} + 3\{65\} - 3\{68\} + 2\{70\} \\ & + 3\{71\} - 3\{72\} - 3\{74\} + 3\{75\} - 2\{76\} + \\ & 3\{77\} + 3\{79\} - 3\{80\} \end{aligned}$$

$$\begin{aligned} \text{Assessment of difficulties} = & 4\{5\} + 4\{7\} - \\ & 3\{8\} + 3\{28\} - 2\{34\} + 2\{45\} - 2\{51\} + 4\{53\} \\ & + 4\{55\} + 1\{62\} + 4\{64\} - 2\{67\} - 4\{72\} + \\ & 4\{79\} + 4\{81\} \end{aligned}$$

$$\begin{aligned} \text{Activity} = & 4\{5\} + 4\{7\} + 3\{12\} + 4\{13\} + \\ & 2\{23\} - 2\{24\} - 2\{28\} - 3\{29\} - 3\{33\} + 1\{36\} \\ & + 3\{38\} + 2\{42\} - 4\{45\} + 4\{53\} + 3\{55\} + \\ & 1\{57\} - 3\{67\} + 3\{79\} \end{aligned}$$

$$\begin{aligned} \text{Reactivity} = & 3\{7\} + 3\{8\} + 5\{12\} + 4\{14\} + \\ & 3\{17\} + 4\{19\} + 3\{33\} - 2\{34\} - 3\{36\} + 4\{37\} \\ & + 4\{38\} + 2\{41\} + 3\{55\} + 3\{66\} \end{aligned}$$

$$\begin{aligned} \text{Plasticity} = & 2\{2\} + 2\{4\} + 3\{5\} + 2\{6\} + \\ & 3\{7\} + 1\{8\} + 4\{9\} + 2\{10\} + 3\{13\} - 4\{15\} + \\ & 2\{17\} + 2\{18\} + 1\{19\} + 4\{20\} - 5\{23\} - 1\{33\} \\ & - 1\{34\} + 3\{35\} + 3\{36\} - 4\{38\} + 3\{41\} + \\ & 3\{42\} - 2\{51\} - 2\{55\} + 3\{64\} - 1\{66\} + 3\{67\} \\ & + 4\{70\} + 1\{74\} + 4\{78\} + 3\{79\} + 3\{81\} \end{aligned}$$

$$\begin{aligned} \text{Speed of mental reactions} = & 3\{12\} + 4\{14\} \\ & + 3\{17\} + 2\{22\} - 3\{34\} + 5\{38\} + 3\{55\} - \\ & 3\{62\} + 3\{65\} + 3\{70\} + 3\{72\} - 2\{74\} + 3\{79\} \end{aligned}$$

$$\begin{aligned} \text{Poise} = & -3\{3\} + 4\{5\} + 5\{7\} - 2\{8\} + 3\{9\} \\ & - 4\{12\} + 5\{13\} - 3\{14\} + 2\{15\} - 1\{19\} + \\ & 3\{22\} - 3\{31\} + 3\{32\} - 3\{33\} - 2\{34\} + 5\{35\} \\ & + 4\{36\} - 5\{38\} - 2\{40\} + 5\{41\} + 4\{42\} - \\ & 3\{51\} + 3\{54\} + 4\{55\} - 3\{57\} - 2\{62\} + 5\{63\} \\ & + 3\{64\} - 4\{66\} - 2\{68\} + 3\{77\} + 5\{79\} + \\ & 4\{81\} \end{aligned}$$

$$\begin{aligned} \text{Extraversion} = & -3\{1\} - 2\{2\} + 4\{5\} - 5\{6\} - \\ & 2\{15\} + 5\{16\} + 4\{17\} - 4\{18\} + 3\{20\} + 4\{25\} \\ & - 3\{26\} + 4\{42\} + 5\{43\} - 2\{44\} - 4\{47\} - \\ & 3\{48\} + 5\{53\} + 4\{56\} + 4\{60\} + 5\{61\} + \\ & 5\{78\} - 4\{80\} \end{aligned}$$

$$\begin{aligned} \text{Excitability} = & 5\{12\} - 2\{13\} + 4\{14\} - 4\{15\} \\ & - 3\{16\} + 2\{26\} + 2\{28\} - 4\{36\} + 1\{37\} + \\ & 5\{38\} - 4\{41\} + 2\{48\} + 3\{55\} + 5\{63\} + 5\{66\} \\ & + 1\{67\} \end{aligned}$$

$$\begin{aligned} \text{Mood stability} = & 3\{5\} + 4\{7\} - 3\{8\} + 4\{9\} \\ & - 4\{12\} + 5\{13\} - 5\{14\} + 2\{17\} - 3\{19\} - \\ & 2\{21\} + 2\{22\} + 1\{23\} - 1\{30\} - 2\{31\} - 3\{33\} \\ & - 4\{34\} + 5\{35\} + 5\{36\} - 2\{17\} - 5\{38\} - \\ & 1\{40\} + 3\{41\} + 4\{42\} + 2\{55\} - 2\{57\} - 2\{62\} \\ & + 4\{63\} - 2\{68\} - 1\{76\} + 4\{77\} + 3\{79\} - \\ & 2\{80\} + 3\{82\} \end{aligned}$$

$$\begin{aligned} \text{Adaptation} = & -4\{3\} + 5\{9\} + 4\{13\} - 4\{14\} \\ & + 3\{16\} + 2\{17\} - 3\{18\} - 4\{19\} + 4\{20\} + \\ & 3\{22\} - 1\{26\} - 2\{28\} + 4\{32\} - 5\{33\} - 5\{34\} \\ & + 4\{35\} - 2\{38\} + 2\{46\} - 4\{47\} - 4\{50\} - \\ & 3\{51\} - 3\{52\} + 4\{54\} - 3\{72\} + 4\{78\} + 5\{79\} \\ & + 4\{81\} + 5\{82\} \end{aligned}$$

$$\begin{aligned} \text{Contact} = & -5\{1\} - 2\{2\} - 4\{4\} + 3\{5\} - \\ & 2\{6\} - 1\{15\} + 5\{16\} + 4\{17\} - 2\{18\} + 4\{20\} \\ & + 4\{25\} - 2\{26\} + 2\{28\} + 5\{42\} - 2\{44\} - \\ & 4\{48\} + 2\{56\} - 1\{75\} + 5\{78\} \end{aligned}$$

$$\begin{aligned} \text{Reaction to the new} = & 3\{7\} - 3\{12\} + 3\{13\} \\ & - 2\{28\} + 1\{32\} + 2\{42\} - 5\{51\} - 2\{62\}. \end{aligned}$$

As a result, the researchers obtained a numerical characteristic of the temperament properties for each respondent. Therefore, it is easy to normalise these quantities for further research and comparison among themselves.

Correlations between Temperament Properties

As mentioned earlier, some properties were interconnected. Thus, a correlation analysis was run to examine the connections and exclude the dependent signs. Table 2 presents the results of the analysis.

Table 2: Absolute values of the correlation coefficients between the temperament properties

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1	0.82	0.92	0.88	0.76	0.64	0.69	0.08	0.96	0.8	0.67	0.93	0.98	0.73	0.9
2	0.82	1	0.64	0.58	0.42	0.88	0.54	0.47	0.88	0.47	0.84	0.9	0.82	0.44	0.78
3	0.92	0.64	1	0.85	0.79	0.43	0.47	0.14	0.79	0.88	0.42	0.75	0.91	0.78	0.79
4	0.88	0.58	0.85	1	0.85	0.37	0.55	0.11	0.81	0.69	0.4	0.75	0.84	0.6	0.79
5	0.76	0.42	0.79	0.85	1	0.17	0.46	0.26	0.68	0.71	0.3	0.62	0.73	0.62	0.76
6	0.64	0.88	0.43	0.37	0.17	1	0.42	0.55	0.75	0.37	0.85	0.8	0.69	0.39	0.61
7	0.69	0.54	0.47	0.55	0.46	0.42	1	0.16	0.74	0.46	0.61	0.72	0.64	0.49	0.67
8	0.08	0.47	0.14	0.11	0.26	0.55	0.16	1	0.21	0.21	0.62	0.24	0.05	0.16	0.11
9	0.96	0.88	0.79	0.81	0.68	0.75	0.74	0.21	1	0.65	0.79	0.99	0.94	0.62	0.93
10	0.8	0.47	0.88	0.69	0.71	0.37	0.46	0.21	0.65	1	0.35	0.63	0.8	0.96	0.66
11	0.67	0.84	0.42	0.4	0.3	0.85	0.61	0.62	0.79	0.35	1	0.82	0.64	0.39	0.72
12	0.93	0.9	0.75	0.75	0.62	0.8	0.72	0.24	0.99	0.63	0.82	1	0.93	0.61	0.9
13	0.98	0.82	0.91	0.84	0.73	0.69	0.64	0.05	0.94	0.8	0.64	0.93	1	0.74	0.88
14	0.73	0.44	0.78	0.6	0.62	0.39	0.49	0.16	0.62	0.96	0.39	0.61	0.74	1	0.63
15	0.9	0.78	0.79	0.79	0.76	0.61	0.67	0.11	0.93	0.66	0.72	0.9	0.88	0.63	1

According to the Table, there is a high correlation

According to the Table, there is a high correlation between some features. For example, the sign “self-esteem” (number 3) has correlations with other signs (stability of the mental state, assessment of difficulties, extraversion, and adaptation) that is greater than 0.8. Indeed, the individual’s self-acceptance is largely dependent on the stability of the mental state and focus on external interaction with the environment. Of course, adaptation and self-esteem are directly dependent on each other. Actually, an individual calmly accepts himself, his actions and goals, and vice versa in an adapted state, and thus it is difficult to achieve a state of adaptability with great self-doubt.

Moreover, if one follows the sign of “adaptation”, one can see a strong connection with poise, extraversion, stability, and some other signs.

The researchers excluded properties related to each other from the study. Therefore, they determined the bonds e” 0.9 from Table 2. First of all, the researchers excluded properties with the greatest value of correlations. There are properties 1 and 12. Then, they excluded 9, which also contained many links. After analysing data in Table 2, the researchers found two more pairs whose properties were interconnected; that is, 10 and 14, 3 and 13. Next, they excluded properties with the maximum sum of correlations from them; that is, 10 and 13. Consequently, they excluded five properties, and thus ten properties left; that is, 2-8, 11, 14, and 15. Table 3 shows the remaining properties.

Thus, the researchers neglected the 10 properties shown in Table 3. In general, they could continue to further exclude properties that are strongly related to others (for example, proper-

Table 3: Values of the correlation coefficients between the remaining properties of temperament

	2	3	4	5	6	7	8	11	14	15
2	1	-0.64	-0.58	-0.42	0.88	-0.54	0.47	0.84	-0.44	-0.78
3	-0.64	1	0.85	0.79	-0.43	0.47	0.14	-0.42	0.78	0.79
4	-0.58	0.85	1	0.85	-0.37	0.55	0.11	-0.4	0.6	0.79
5	-0.42	0.79	0.85	1	-0.17	0.46	0.26	-0.3	0.62	0.76
6	0.88	-0.43	-0.37	-0.17	1	-0.42	0.55	0.85	-0.39	-0.61
7	-0.54	0.47	0.55	0.46	-0.42	1	-0.16	-0.61	0.49	0.67
8	0.47	0.14	0.11	0.26	0.55	-0.16	1	0.62	0.16	-0.11
11	0.84	-0.42	-0.4	-0.3	0.85	-0.61	0.62	1	-0.39	-0.72
14	-0.44	0.78	0.6	0.62	-0.39	0.49	0.16	-0.39	1	0.63
15	-0.78	0.79	0.79	0.76	-0.61	0.67	-0.11	-0.72	0.63	1

ties with correlation coefficients greater than 0.85 could be excluded).

CONCLUSION

According to the research design, a questionnaire was prepared to identify the properties of psychological temperament. Therefore, three different groups of respondents ($n=235$) who were students of Kazan Federal University were surveyed in this study. The formulas were presented for calculating 15 properties of temperament according to a survey. Then, correlation between various properties was investigated. The results were reported in a crosstab. Consequently, five properties identified by other properties were detected and excluded and final table of correlation coefficients was given for the remaining 10 properties of temperament. It can be assumed that the temperament types are successfully classified by these signs.

RECOMMENDATIONS

This study considered the key four kinds of temperaments and the properties determining them. Future studies could continue to further exclude properties that are strongly related to others, also it is suggested to have a fieldwork to compare the results of the current study.

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