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Original article

The Ayurveda concept of *Prakṛti* and the Western construct of personality: A comparative pilot study

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Abstract

Introduction: In the Indian medical system of Ayurveda, health results from the balanced interplay between three functional principles or *doṣa* – *Vāta*, *Pitta*, and *Kapha* – that regulate psychophysical functions. The relative proportion of the three *doṣa* in an individual determines the person's psychophysical constitution, *Prakṛti*. The aim of this pilot study was to jointly assess individuals' *Prakṛti* and personality and emotional traits, investigating convergences and divergences between the two classification approaches.
Method: Data were collected among 391 adult participants through the following self-assessment instruments: Questionnaire on Doṣa *Prakṛti* AyurVeda (QDAV), specifically developed in this study to evaluate *Prakṛti*; Big Five Inventory (BFI) to assess personality; Positive Affect Negative Affect Schedule (PANAS), to evaluate emotional profile; Short Form Health Survey (SF-36), to measure perceived health. Participants' *Prakṛti* profile was identified first through QDAV and subsequently through its implemented version QDAV-R. Individuals characterized by predominant *Vāta*, *Pitta*, or *Kapha Prakṛti* ($N = 173$) were selected for subsequent analyses. Personality, emotional profile, and perceived health were compared across these groups through nonparametric procedures.
Results: QDAV-R allowed for effectively classifying participants according to their *Prakṛti*. Personality, emotional and health features reported by *Vāta*, *Pitta*, and *Kapha* participants were consistent with the corresponding descriptions provided in the Ayurveda literature.
Discussion: Findings suggest that *Prakṛti* classification can be fruitfully integrated into diagnostic and treatment protocols in healthcare and psychotherapy. These results can inform future studies, aimed at combining psychophysical measures derived from different knowledge traditions within an authentically integrated and person-centered approach to health and well-being.
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Keywords: Ayurveda; *Prakṛti*; Personality; Person-centered; Biopsychosocial; Integrative medicine; Psychotherapy

Introduction

The debate around health, well-being and their measurement is becoming increasingly popular worldwide. Recently, the role of individuals' subjective evaluations and psychological features in health and disease management attracted the interest of researchers and practitioners. This topic represents one of the basic pillars of Ayurveda, the traditional Indian system of medicine. The concept of individual constitution – *Prakṛti* – includes both physical and mental components, whose conditions of balance or imbalance influence health preservation and disease onset. In the light of the current claims for a person-centered approach to prevention and treatment, the joint study of individual *Prakṛti* and the psychological constructs identified by western science, while highlighting their similarities and differences, can foster a more integrated view of health, and contribute to the development of personalized intervention strategies.

Health as complete well-being: problems and challenges

According to the World Health Organization, health is "a state of complete physical, mental and social well-being" [1].

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The potential embedded in this biopsychosocial definition [2] is universally acknowledged, but seldom translated into practice, as highlighted by health and social scientists [3–5]. Western medicine is still dominated by the biomedical approach, and its prominent goal is disease treatment rather than health promotion.

What is more, the WHO health definition entails two terminology problems. The adjective "complete" equals health to a utopian goal of no practical use [6]. The unspecific term "well-being" is *de facto* usually understood as health-related quality of life, and measured through objective indicators such as physical conditions and demographic features. Subjective well-being indicators such as positive emotions, meaning and goal pursuit, and self-actualization are instead neglected, despite growing evidence of their importance for health [7–9]. Two persons with the same degree of physical health may differ in their level of functioning based on psychological features [10,11]. Thus, the claim for person-centered health care makes the assessment of psychological dimensions a compelling need in both research and practice [12–14].

Individual differences and personality

Within western psychology, a scientific taxonomy of individual types was developed through studies using natural languages as sources of human attributes [15]. These studies led to the identification of a set of individual characteristics, that were variously categorized [16] until a consensus was reached around five recurrent factors, the "Big Five": Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to experience [17,18]. The Big Five represent personality traits at the broadest level of abstraction. They include more specific characteristics [19] and recur across different languages [20].

The Big Five classification shows however some limitations. First, it is atheoretical in nature [21]. Second, although it allows for efficient personality descriptions [22], each factor subsumes different characteristics, whose aggregation results in a loss of information [23]. Third, personality features are but a component of the complex psychological landscape. Therefore, in most studies the analysis of personality is integrated with the investigation of other cognitive, affective and motivational dimensions [24].

The Ayurvedic view: health as balance

In Ayurveda health is conceptualized from a holistic perspective, and it comprises physiological, psychological, social and spiritual dimensions. Ayurveda is rooted in a philosophical view [25], according to which the manifestation of all living entities stemmed from the interaction between the passive and unchangeable consciousness principle, and the active and dynamic material principle. Within this view, the material elements of reality derive from the spiritual and psychological ones, and the individual soul, or Self (*Ātman*) is ontologically identical to the universal consciousness principle. Life – *Ayus* – is defined as the conjunction of body, sense organs, mind, and self (Ćaraka Saṃhitā, SūtraSthāna: 1, 46–47) [26]. Health is the harmonious balance of biological, physiological, mental and spiritual functions (Suśruta Saṃhitā, SūtraSthāna: 15, 38) [27].

Balance is considered as the natural state of the individual. At the psychophysical level, it is described as the interplay of three principles known as *doṣa–Vāta*, *Pitta*, and *Kapha*. The *doṣa* regulate strategic life functions at the body and mind levels [28]. *Vāta* governs movement, controlling blood circulation, elimination of waste, breathing, and the flow of perceptions and thoughts. *Pitta* governs heat and transformation, controlling food digestion, elaboration of sensory inputs, and intellectual discrimination. *Kapha* is responsible for the body structure, promotes physical cohesion and immunity, supports memory retention and mental stability.

Prakṛti*: the psychophysical constitution in Ayurveda*

According to their relative proportions, the three *doṣa* determine the individual constitution, or *Prakṛti* (Ćaraka Saṃhitā, SūtraSthāna: 30, 25) [26]. Individuals with different *Prakṛti* differ in body structure, physiological functioning, and mental characteristics. The pure *Prakṛti* types, characterized by the predominance of one *doṣa* over the other two, were classified with astonishing precision in Ćaraka Saṃhitā (VimanaSthāna: 8, 96–98) [26]. This classification is based on the qualities characterizing each *doṣa*. In particular, *Vāta* individuals show the qualities of roughness, lightness, mobility, swiftness, coldness and coarseness, reflected in features such as rough skin, fragile body structure, fast movements, intolerance to cold, emotional and behavioral instability. The prominent qualities of *Pitta* individuals are hotness, sharpness, pungency, sourness, and liquidity, resulting into strong appetite, thirst and perspiration, powerful and quick digestion, lax and soft joints, intolerance to heat, willpower and decisiveness. Finally, individuals with predominance of *Kapha* are characterized by unctuousness, smoothness, sweetness, softness, dullness, heaviness, and solidity. They show a compact body, strong joints, little hunger and thirst, slow movements and behaviors, emotional stability, and trustfulness.

Regardless of its componential structure, the healthy *Prakṛti* relies upon a dynamic balance among physiological and psychological dimensions. This balance can be easily disturbed by changes in the relative proportions of *doṣa*. The onset of these changes is influenced by three overarching qualities of the mind, the *Triguna*: *satva*, *rajas*, and *tamas*, that represent the principle of equilibrium, proneness to action and inertia respectively. People sharing the same *Prakṛti* type can differ according to *guna* preponderance. A *sātvic* person shows self-control and serenity. A *rājasic* person is restless and driven by passion and desire. A *tāmasic* person is depressed, lethargic and negligent (Ćaraka Saṃhitā, ŚarīraSthana: 4, 36) [26]. Therefore, a truly exhaustive evaluation of an individual should include the joint investigation of *doṣa* and *triguna*, since the former do not show spiritual implications, while the latter are not related to physical dimensions [29]. Moreover, although the evaluation of the individual *Prakṛti* plays a prominent role in Ayurveda, "collective" *Prakṛti* types are also described in the classical texts.

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Jatiprakṛti is related to race, *Kulaprakṛti* to genetic inheritance, *Deśānupātinīprakṛti* to society and culture features, *Kālaprakṛti* to ecosystem and climate, and *Vayaprakṛti* to the aging process (Ćaraka Samḥitā, IndriyaSthana: 1,5) [26]. Nevertheless, most studies are focused on *doṣa-Prakṛti* only [30–32], and very few ones investigate *triguna*-related aspects, however ignoring *doṣa* components [33,34].

In spite of such simplifications, the effort to systematically assess individual *Prakṛti* has brought forth important advancements, highlighting convergences between traditional and modern science. In the biomedical domain, researchers have recently paid attention to the relationships between individual *Prakṛti* types and biological functions and structures. Encouraging consistencies between the two perspectives were specifically detected at the genetic level [35,36].

Prakṛti *and personality: two comparable constructs?*

Despite sharing an empirical bottom-up approach, *Prakṛti* and personality differ in underlying conceptual frameworks and components. *Prakṛti* classification is based on relatively stable and panhuman bio-physiological and behavioral features, while the Big Five classification relies on psychological features described through natural languages, and thus related to values and traditions that may vary across cultures and time. *Prakṛti* was conceptualized within a well-defined philosophical view, while personality is a descriptive and atheoretical construct. *Prakṛti* results from the interplay of morpho-physiological, psychological and behavioral features, while personality includes psychological and behavioral dimensions, ignoring physical ones. Nevertheless, exploring their similarities and differences may help build connections between systems of thought that have been traditionally considered as substantially incompatible.

Aims of the study

This study aims to investigate the relationship between personality as operationalized through the Big Five factors and individual *Prakṛti*, with the purpose to detect consistencies and divergences between the two constructs. Since *Prakṛti* represents a unitary construct including biological, physiological, psychological, and behavioral components, it can be evaluated through a single assessment instrument. On the contrary, in western psychology the study of human functioning is compartmentalized into multiple domains. Therefore, in order to maximize data comparability, the evaluation of personality will be integrated with the assessment of emotional and physical dimensions. As concerns *Prakṛti*, only *doṣa* related features will be investigated, without considering *triguna* components. This decision is again based on comparability reasons. While several facets of the Big Five show substantial similarities with the psychological components of *doṣa Prakṛti*, neither the metacognitive and spiritual components nor the moral or value judgments present in the *triguna* classification are included in the personality construct.

Method

Procedures

Data were collected among adult volunteers, with the aim to include people in the productive life stage, living in urban areas and balanced in number as concerns gender. After project approval by the University of Milano ethical committee (no. 34/11, December 2011), participants were recruited through the snowball technique. With the help of colleagues, a list of eligible persons matching inclusion criteria and working in different domains was compiled. These people were invited to participate in the survey and to provide contacts of further potential participants. All participants received information about the project and research instruments, and filled out informed consent forms. They could complete the questionnaires immediately, or at a convenient time and place within the subsequent two weeks. Participants were invited to return the questionnaires either directly to researchers, or via mail. Their anonymity was guaranteed in both data coding and storing phases.

Instruments

Data were collected through a set of self-report questionnaires.

Questionnaire on DoṣaPrakṛti AyurVeda (*QDAV*). QDAV (Appendix A) was designed to identify participants' *Prakṛti*. It represents an adaptation of a 60-item questionnaire developed and used at the Milano School of Ayurveda "Ayurvedic Point". The original questionnaire comprised three sections, each corresponding to one *doṣa*: *Vāta*, *Pitta*, and *Kapha*. Each section included 20 items describing biological, psychological and behavioral features. Within each section, items were formulated in order to fit a specific *Prakṛti* type. For example, in the *Vāta* section body structure was described as "slim, with tiny bones", and in the *Kapha* section as "strong and sturdy, with big bones". Participants were asked to fill in all the sections, reporting on a 4-point scale their level of agreement with each of the 60 statements. This way to assess *Prakṛti* is widely used in Ayurveda literature [31]. However it takes much time, items may appear repetitive, and the multiple agreement ratings on the same dimension across sections generate problems of comparability and interpretation of findings.

In the attempt to avoid these problems, within QDAV each dimension is rated through only one scaled item, thus collapsing the 60 questions into 20 items, 19 of them formulated as five-point scales and one requiring the selection of one answer among three options. Eleven items investigate biological dimensions (at either the morphological or physiological levels); five items explore aspects of the psychological functioning (such as memory and decision-making style); three items refer to behavioral patterns (eating schedule, spending money, cultivating relationships). In each scale, the lowest value (1) describes features typical of *Vāta Prakṛti*; the central value (3) refers to *Pitta* features, and the highest value (5) to *Kapha* ones. Values 2 and 4 represent intermediate *Vāta*/*Pitta* and *Pitta*/*Kapha* features

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respectively. Item 20 instead provides three brief descriptions of psychological features, each of them considered as typical for one *Prakṛti* type. Participants were invited to select the item value (or the description, for item 20) that best represented them.

Big Five Inventory (BFI) [37]. The instrument consists of 44 items representing psychological attributes or behaviors. Participants are invited to describe themselves rating their level of agreement with each item on a five-point scale (1 = strongly disagree; 5 = strongly agree). Item grouping results in the Big Five factors: Extraversion, Agreeableness, Conscientiousness, Emotional Instability/Neuroticism, and Openness to experience. The BFI showed adequate validity and reliability [21]. The validated Italian version [38] was used in this study.

Positive Affect and Negative Affect Schedule (PANAS) [39]. This instrument is widely used to assess positive and negative affect. It consists of 20 five-point scaled items. The Positive Affect (PA) scale includes 10 items describing positive emotions such as being enthusiastic and excited. The Negative Affect (NA) scale comprises 10 items describing aversive affects such as fear and nervousness. PA and NA are usually evaluated as dispositional traits – participants are invited to rate the frequency or intensity of each emotion reported on average during an extended period. The Italian version used in this study showed excellent reliability and validity [40].

The Short Form Health Survey (SF-36, version 1) [41]. The instrument, designed to investigate individuals' self-assessment of health, comprises 36 items, grouped into eight dimensions: degree of limitation in performing physical activities (Physical Functioning); experienced problems with daily activities as a result of physical health (Role Limitations due to Physical Problems); interference with usual social activities due to physical and emotional problems (Social Functioning); experienced body pain and the resulting degree of interference with normal activities (Bodily Pain); perceived anxiety, depression, loss of behavioral and emotional control, and happiness (General Mental Health); problems with daily activities as a results of emotional problems (Role Limitations due to Emotional Problems); perceived energy, endurance and fatigue (Vitality), and perceived level of health (General Health Perception). The standard version of the survey, employed in the present study, covers a four week recall period. Higher scores indicate a more favorable health status. The value of each dimension can be calculated either as the mean of the single item ratings, or as their sum, subsequently transformed in order to obtain a common range of values from 0 (worst health) to 100 (best health), comparable across dimensions. The instrument was validated and normed in Italy [42].

Results

Sample

The sample comprised 391 adult volunteers (55.5% women), aged 39 on average (range 20–60), and living in urban areas of Northern Italy. As concerns education, 38% of the participants had a high school diploma, 21% a college graduation, and 37.4% a post-graduation degree; the remaining 3.6% did not provide this information. Most participants (89%) were full-time workers, prominently as office employees (35.3%), helping professionals (23.5%), freelance or self-employed professionals (10.2%), and engineers/technicians (10%).

Prakṛti *classification*

Participants' *Prakṛti* was identified through QDAV. A methodological premise is here necessary. As previously highlighted, the classification of *Prakṛti* types is based on qualities and related features, rather than quantitative measures. When translated into research instruments, such a qualitative approach inevitably implies the adoption of multiple assessment criteria: Some qualities are more easily quantifiable through an ordinal scale (for example, body structure or memory strength), while others are best represented through nominal categories (for example, eye and skin features). Since this heterogeneity was reflected in item formulation, only descriptive nonparametric procedures were used to analyze QDAV data.

The frequency of each value was first calculated across the 19 five-point items, and five new variables were created for each participant: *Vāta* (value = 1 frequency across the 19 items); intermediate *Vāta*/*Pitta* (value = 2 frequency); *Pitta* (value = 3 frequency); intermediate *Pitta*/*Kapha* (value = 4 frequency); and *Kapha* (value = 5 frequency). An additional variable "*Prakṛti*" was built based on the frequency pattern of the single *doṣa* (or intermediate value): If a value predominated on the others (frequency => 9) the participant was attributed the corresponding *Prakṛti* type. If more values showed a similar frequency across items, thus making it difficult to identify a clear profile, the participant was discarded from subsequent analyses. This strategy proved to be excessively conservative: only 5 participants were identified as *Vāta* types, 4 as *Kapha* types, and 87 as *Pitta* types. This remarkable imbalance, and the prominence of intermediate types, could be related to different issues: rarity of pure *Prakṛti* types; genetic characteristics of the population under investigation; participants' tendency to avoid extreme scale values; intrinsic limitations of the assessment instrument. The first issue is clarified in Ayurveda literature, showing that mixed or dual *Prakṛti* types are far more frequent than pure ones. The relatively high percentage of participants (22.5%) reporting *Pitta* features is consistent with other studies involving European samples [27]. In the specific case of Italy, this finding may be also related to the historically recurrent genetic mixture, possibly favoring less extremely characterized genotypes. As concerns the risk for response set, supported by the correspondence of *Pitta* features with the central point of the scales, this problem was not detected for the other questionnaires, thus making this explanation less plausible.

As concerns the fourth issue – adequacy of QDAV for *Prakṛti* identification – conceptual and empirical aspects were considered. The conceptual adequacy of item formulation was supported by a careful analysis of each *Prakṛti* type's features, as described in the classical texts and in the assessment instruments currently used. At the empirical level, it was necessary to verify whether *Prakṛti* types could be differentiated through QDAV items. Since the number of extreme *Vāta* and *Kapha*

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Table 1
Mean rank scores of QDAV items across *Prakṛti* types.

	VATA (*N* = 35) *M*	*PITTA* (*N* = 103) *M*	*KAPHA* (*N* = 35) *M*	χ^2, *p*
1. Body structure	54.31	79.70	120.83	40.99*** (V < P < K)
2. Teeth structure	67.96	76.30	111.96	19.99*** (V,P < K)
3. Fingers	60.14	85.41	95.62	14.49*** (V < P,K)
4. Neck	49.88	87.71	105.31	37.49*** (V < P,K)
5. Weather sensitivity	65.88	77.07	104.55	13.42*** (V,P < K)
6. Lips	72.33	77.48	100.91	8.26* (P < K)
7. Eyes	73.61	76.93	100.51	8.08* (V,P < K)
8. Skin	54.31	83.87	101.65	21.81*** (V < P,K)
9. Fat distribution	74.04	74.98	93.83	4.55 ns
10. Body structure during childhood	48.79	83.60	120.41	47.55** (V < P < K)
11. Memory	62.96	83.04	98.59	12.39** (V < P,K)
12. Spending style	66.73	81.05	98.72	10.22** (V,P < K)
13. Decision making	61.09	82.68	102.85	15.61*** (V < P < K)
14. Learning	68.55	89.44	68.64	9.53**
15. Meal schedule	72.80	76.33	98.54	6.45*
16. Cognitive style	56.50	83.26	102.81	20.60*** (V < P < K)
17. Relationships	74.02	80.98	86.78	1.50 ns
18. Movements	61.38	82.15	104.11	16.48*** (V < P < K)
19. Daily planning	63.57	86.23	83.75	8.60* (V < P)

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

participants was extremely low, it was decided to pool together values 1 and 2 (*Vāta* and *Vāta*/*Pitta*) and values 5 and 4 (*Kapha* and *Kapha*/*Pitta*): Participants with a frequency of the pooled values => 15 were classified as *Vāta* and *Kapha* respectively. This strategy led to the classification of 45 *Vāta* participants, and 27 *Kapha* ones, that were added to the 87 *Pitta* participants previously identified. A nonparametric ANOVA based on rank scores calculation and Kruskal–Wallis test was conducted, in order to evaluate whether the value selected by participants for each of the 19 scales varied across groups. A post hoc pairwise, two-sided multiple comparison analysis using Dwass, Steel, and Critchlow-Fligner Method (DSCF) was also performed. Results are reported in Table 1.

This analysis provided information on two major issues: the representativeness of each item in identifying *Prakṛti* features; the effectiveness of each item in distinguishing between types. As Table 1 shows, two items (fat distribution and relationship pattern) did not vary significantly in ranking across groups; two other items (learning style and meal schedule) showed overall variation, but no significant differences in the pairwise comparisons. As for item 20, analyzed through a contingency table reporting the frequency of each description across *Prakṛti* types, Chi-square statistics did not highlight group differences. These five items were therefore dropped, and *Prakṛti* was again calculated for the whole sample ($N = 391$) on the 15-item version of the instrument, QDAV-R. The minimum frequency of value 1 + 2, 3, and 4 + 5 to assign an individual to the corresponding typology (*Vāta*, *Pitta*, and *Kapha* respectively) was set to 8. This procedure led to the identification of 173 individuals as relatively pure *Prakṛti* types: 35 *Vāta*, 103 *Pitta*, and 35 *Kapha*. Their answers to QDAV-R items were analyzed again through a nonparametric ANOVA with pairwise comparison. Results are illustrated in Table 2.

Overall, QDAV-R allowed for better distinguishing *Prakṛti* features across groups. For most items, the global Chi-square value was higher than in the original version of the instrument, and each group significantly differed from the other two in the pairwise comparisons. Only for item 3 was no group difference detected. This categorization was thus deemed as acceptable, and the subsample comprising these 173 participants was used in the subsequent steps of the study to investigate the relationship between *Prakṛti* type and personality, affect, and self-reported health.

Subsample demographic features

Demographic features were analyzed in the whole subsample and across *Prakṛti* types. The subsample was substantially similar to the original global sample as concerns gender (50.9% women), age ($M = 39.9$, range 20–60), education level and job distribution. In particular, 40% of the participants had a high school diploma, 20.8% a college graduation, and 35.8% a post-graduation degree; the remaining 3.4% did not provide this information. Working participants (90%) were prominently office employees (37.6%), helping professionals (21.4%), freelance or self-employed professionals (11%), and engineers/technicians (9.2%). Some differences were instead detected across *Prakṛti* types. As concerns gender distribution ($\chi^2 = 8.02$, $p < 0.02$), women predominated in the *Vāta* group (71.4%, partial $\chi^2 = 5.92$). As concerns age ($F = 5.15$, $p < 0.006$), Tukey post hoc comparison ($t = 3.34$, $p < 0.05$) showed that

Table 2
Mean rank scores of QDAV-R items across *Prakṛti* types.

	VATA (*N* = 35) *M*	*PITTA* (*N* = 103) *M*	*KAPHA* (*N* = 35) *M*	χ^2, p^a
1. Body structure	48.32	85.65	127.14	50.73*** (V < P < K)
2. Teeth structure	64.63	84.60	116.44	24.69*** (V < P < K)
3. Fingers	74.17	88.11	96.54	4.25 ns
4. Neck	46.30	92.19	112.43	44.27*** (V < P < K)
5. Weather sensitivity	63.53	83.61	116.31	13.42*** (V < P < K)
6. Lips	61.83	85.35	117.03	25.54*** (V < P < K)
7. Eyes	79.14	80.20	114.85	16.70*** (V,P < K)
8. Skin	54.25	87.40	111.04	21.81*** (V < P < K)
9. Body structure during childhood	47.38	89.39	119.57	47.55*** (V < P < K)
10. Memory	57.20	90.03	107.88	21.23*** (V < P,K)
11. Spending style	60.14	89.12	107.60	20.64*** (V < P < K)
12. Decision making	67.46	86.96	106.66	11.67*** (V < P,K)
13. Cognitive style	53.37	90.05	108.24	24.73*** (V < P < K)
14. Movements	65.24	85.41	113.43	18.22*** (V,P < K)
15. Daily planning	58.32	91.49	99.19	16.42*** (V < P,K)

*** $p < 0.001$.

Vāta participants were significantly younger that *Kapha* ones ($M = 35.6$ and $M = 43.7$ respectively).

Prakṛti *and personality*

BFI mean values were compared across *Prakṛti* groups both at the general factor level and at the item level, using a nonparametric ANOVA followed by a post hoc pairwise comparison through Tukey test. In order to control for individual differences in acquiescent responding, before factor calculation item values were centered on each participant's set of responses.

As Table 3 shows, several group differences were detected. At the factor level, *Vāta* participants reported significantly higher values of Emotional Instability and Openness to Experience than *Kapha* participants, and significantly lower values of Conscientiousness than participants in the other groups.

A more fine-grained analysis at the item level further supported these differences. Conscientiousness provided the clearest characterization of the three groups. *Pitta* individuals reported being significantly more careful, organized and able to do a thorough job than *Vāta* participants; moreover, they shared with *Kapha* individuals higher values of perseverance and lower tendency to get distracted compared with *Vāta* ones. A significant group difference was also detected for the item "makes plans and follows them through", and a tendency to significance for "reliable worker". In both cases, however, pairwise comparisons did not provide further information, even though *Pitta* participants reported higher values than the other groups. As concerns Emotional Instability, *Vāta* participants scored significantly lower than the other groups for the items "emotionally stable" and "calm in tense situations". A tendency toward significance in the expected direction (with *Kapha* participants scoring highest) was detected for "relaxed, handles stress well". Within Openness to experience *Vāta* participants reported higher values than the other groups in most items, while *Kapha* individuals scored lowest. However, only the item "values artistic experiences" differed significantly among groups, while a general tendency toward significance emerged for "active imagination", "inventive" and "plays with ideas". Finally, even though the groups did not differ for Agreeableness at the factor level, *Vāta* participants scored significantly higher for the item "I am usually trusting", and *Kapha* participants for "I can be cold and aloof". ANOVA also highlighted a significant group difference for the item "I am considerate and kind" that however could not be further specified at the pairwise comparison level, even though *Pitta* participants – as expected – reported lower scores than the other two groups.

Prakṛti *and affect*

Table 4 shows the mean values of the PANAS variables across *Prakṛti* types, as well as the results of the nonparametric ANOVA and Tukey post hoc comparisons. Significant differences emerged for the variables "alert" and "attentive", with *Vāta* participants reporting lower scores than the other groups in both cases. As concerns the aggregated dimensions, Positive Affect significantly differed across groups, but the post hoc pairwise comparison did not provide additional information, even though *Vāta* participants reported lower values than *Pitta* and *Kapha* ones.

Prakṛti *and self-reported health*

Table 5 shows the mean transformed values of SF-36 dimensions across groups, as well as the results of ANOVA and post hoc comparisons. Regardless of their *Prakṛti* type, participants reported good health – as expected from the criteria guiding the original sample selection. Across groups, values were aligned with the national normative ones. However, *Vāta* participants reported the highest role limitations due to emotional problems, differing significantly from *Pitta* participants.

It is worth noting that, even though the number of participants in the three groups differed, the within-group score variability

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Table 3
Mean values of the Big Five factors and their components across *Prakṛti* types.

Variables	*VATA* (*N* = 35) *M* (sd)	*PITTA* (*N* = 103) *M* (sd)	*KAPHA* (*N* = 35) *M* (sd)	*F*, *p*
Extraversion	3.1 (0.7)	3.2 (0.8)	3.2 (0.7)	0.57 ns
Talkative	3.4 (1.3)	3.6 (1.3)	3.5 (1.4)	0.20 ns
Reserved (R)	4.1 (0.8)	3.9 (1.1)	3.9 (1.2)	0.76 ns
Full of energy	3.7 (0.9)	3.7 (0.9)	3.7 (0.9)	0.14 ns
Generates enthusiasm	3.3 (0.8)	3.2 (1.0)	3.2 (1.1)	0.30 ns
Quiet (R)	3.3 (1.2)	3.1 (1.3)	3.3 (1.2)	0.63 ns
Assertive personality	3.4 (1.0)	3.7 (1.0)	3.6 (0.9)	1.29 ns
Shy, inhibited (R)	3.5 (1.2)	3.2 (1.2)	3.4 (1.3)	0.84 ns
Outgoing, sociable	3.6 (1.1)	3.7 (1.1)	3.8 (1.1)	0.50 ns
Agreeableness	3.9 (0.5)	3.8 (0.6)	3.7 (0.5)	1.51 ns
Finds fault with others (R)	2.8 (1.0)	2.9 (1.2)	3.2 (1.3)	0.30 ns
Helpful and unselfish	4.1 (0.7)	4.1 (0.7)	4.3 (0.7)	0.92 ns
Starts quarrels (R)	1.6 (1.0)	1.6 (0.9)	1.5 (0.9)	0.10 ns
Forgiving nature	3.6 (2.3)	3.7 (1.1)	3.6 (1.3)	0.14 ns
Trusting	4.0 (0.8)	3.3 (1.1)	3.2 (1.2)	5.61** V > P,K
Cold and aloof (R)	2.5 (1.2)	2.8 (1.2)	3.4 (1.2)	4.86** K > P,V
Considerate and kind	4.1 (0.8)	3.7 (0.9)	4.0 (0.7)	3.37*
Rude to others (R)	1.7 (0.9)	1.6 (0.9)	1.6 (1.0)	0.05 ns
Cooperates with others	4.1 (0.8)	4.1 (0.9)	3.9 (1.0)	1.02 ns
Conscientiousness	3.8 (0.6)	4.1 (0.5)	4.1 (0.5)	6.67** V < P,K
Does a thorough job	4.1 (0.8)	4.5 (0.6)	4.4 (0.8)	5.04** V < P
Somewhat careless (R)	2.3 (1.4)	1.7 (1.0)	2.0 (1.2)	3.84* V > P
Reliable worker	4.5 (0.6)	4.7 (0.5)	4.5 (0.6)	2.49+
Disorganized (R)	2.5 (1.1)	2.0 (1.1)	2.1 (1.3)	2.88+ V > P
Lazy (R)	2.5 (1.2)	2.5 (1.2)	2.9 (1.3)	1.51 ns
Perseverant	3.9 (0.9)	4.4 (0.7)	4.6 (0.7)	8.80*** V < P,K
Does things efficiently	3.9 (0.6)	4.1 (0.7)	4.1 (0.6)	1.37 ns
Makes and follows plans	3.7 (0.9)	4.1 (0.7)	3.9 (0.9)	3.10*
Easily distracted (R)	2.9 (1.3)	2.3 (1.0)	2.0 (1.0)	5.77** V > P,K
Emotional instability	3.1 (0.7)	2.9 (0.6)	2.7 (0.8)	3.42* V > K
Depressed, blue	1.9 (1.1)	2.0 (1.0)	1.8 (1.0)	0.18 ns
Relaxed, handles stress well (R)	2.8 (1.1)	3.0 (1.0)	3.3 (1.1)	2.37+
Tense	3.9 (1.0)	3.6 (1.0)	3.6 (0.9)	1.72 ns
Emotionally stable (R)	2.8 (1.0)	3.5 (0.9)	3.6 (1.3)	7.81*** V < P,K
Moody	3.4 (1.2)	3.3 (1.2)	3.1 (1.2)	0.58 ns
Calm in tense situations (R)	3.1 (1.1)	3.7 (0.8)	3.8 (0.8)	7.13** V < P,K
Worries a lot	3.7 (1.1)	3.4 (1.0)	3.3 (1.2)	1.49 ns
Gets nervous easily	2.6 (1.2)	2.8 (1.1)	2.6 (1.2)	0.90 ns
Openness to experience	3.8 (0.6)	3.7 (0.7)	3.4 (0.7)	3.54* V > K
Curious	4.0 (1.0)	3.9 (1.0)	3.8 (1.0)	0.18 ns
Original, new ideas	3.8 (1.1)	3.6 (1.0)	3.3 (1.1)	0.14 ns
Ingenious	3.7 (1.0)	3.8 (1.0)	3.6 (1.1)	0.45 ns
Active imagination	4.2 (0.8)	3.8 (1.0)	3.7 (1.2)	2.73+
Inventive	3.7 (0.8)	3.5 (1.0)	3.2 (1.1)	2.72+
Values artistic experiences	4.3 (1.0)	3.9 (1.1)	3.5 (1.2)	4.00* V > K
Prefers routine work (R)	2.3 (1.3)	2.3 (1.0)	2.7 (1.4)	1.86 ns
Plays with ideas	4.1 (0.8)	3.9 (0.9)	3.6 (1.2)	2.37+
Few artistic interests (R)	2.3 (1.4)	2.6 (1.3)	2.7 (1.4)	0.86 ns
Sophisticated in art	3.1 (1.2)	3.1 (1.1)	2.8 (1.3)	1.12 ns

Note. (R) reversed score.
+ $p < 0.10$.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

was highly homogeneous across the three profiles for all the variables examined. This is highlighted by the substantial similarity in the standard deviation values across groups, as reported in Tables 3–5.

Discussion

This work provided a descriptive analysis of the relationships between *Prakṛti* – the individual constitution formalized by

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Table 4
Mean values of PANAS variables and global affect dimensions across *Prakṛti* types.

	VATA (*N* = 35) *M* (ds)	*PITTA* (*N* = 103) *M* (ds)	*KAPHA* (*N* = 35) *M* (ds)	*F*, *p*
Interested	3.8 (0.7)	4.0 (0.7)	3.9 (0.6)	0.70 ns
Distressed	2.4 (1.2)	2.4 (1.0)	2.3 (1.1)	0.34 ns
Excited	3.0 (0.9)	3.1 (0.9)	3.5 (0.8)	2.98 ns
Upset	2.4 (1.2)	2.5 (1.0)	2.2 (0.9)	1.32 ns
Strong	3.2 (0.8)	3.4 (0.8)	3.5 (0.8)	1.75 ns
Guilty	2.2 (1.3)	2.0 (1.0)	1.9 (1.0)	0.84 ns
Scared	2.2 (1.0)	2.1 (1.0)	2.0 (1.2)	0.20 ns
Hostile	1.8 (1.1)	1.9 (0.9)	2.1 (1.1)	0.38 ns
Enthusiastic	3.5 (1.2)	3.7 (0.9)	3.5 (1.1)	0.93 ns
Proud	3.5 (1.0)	3.7 (1.0)	3.9 (1.1)	1.35 ns
Irritable	2.9 (1.3)	2.9 (1.0)	3.1 (1.2)	0.80 ns
Alert	3.3 (0.8)	3.8 (0.8)	4.0 (1.0)	6.45** V < P,K
Ashamed	2.1 (1.3)	1.7 (0.8)	1.9 (1.3)	1.99 ns
Inspired	3.0 (0.9)	3.2 (1.0)	3.2 (1.1)	0.42 ns
Nervous	3.2 (1.1)	3.0 (1.0)	3.1 (1.2)	0.86 ns
Determined	3.7 (0.9)	4.0 (0.8)	4.1 (0.9)	2.02 ns
Attentive	3.6 (0.8)	4.1 (0.7)	4.0 (1.0)	5.23** V < P,K
Jittery	2.7 (1.2)	2.5 (1.1)	2.7 (1.0)	0.66 ns
Active	4.1 (0.8)	4.0 (0.8)	3.9 (1.1)	0.47 ns
Afraid	2.0 (1.0)	1.9 (1.0)	1.9 (0.8)	0.81 ns
Positive affect	3.5 (0.4)	3.7 (0.5)	3.7 (0.6)	3.15*
Negative affect	2.4 (0.9)	2.3 (0.7)	2.3 (0.6)	0.26 ns

* $p < 0.05$.
** $p < 0.01$.

Table 5
Mean transformed scores of the SF-36 dimensions across *Prakṛti* types.

	VATA (*N* = 35) *M* (sd)	*PITTA* (*N* = 103) *M* (sd)	*KAPHA* (*N* = 35) *M* (sd)	
Physical functioning	93.5 (12.4)	93.6 (12.9)	94.4 (10.8)	0.07 ns
Role limitation/physical	82.9 (27.0)	89.2 (24.0)	90.7 (21.1)	1.14 ns
Bodily pain	71.9 (22.3)	78.9 (21.4)	80.4 (23.7)	1.63 ns
Social functioning	69.3 (25.4)	75.2 (19.7)	74.6 (20.0)	1.07 ns
Mental health	68.0 (19.5)	68.9 (13.9)	71.6 (16.0)	0.55 ns
Role limitation/emotional	68.6 (36.1)	85.6 (28.0)	81.9 (29.5)	4.19** V < P
Vitality	57.4 (15.6)	60.1 (14.6)	57.0 (18.5)	0.70 ns
General health	67.4 (17.5)	68.4 (16.6)	72.1 (14.0)	0.85 ns

** $p < 0.01$.

Ayurveda – and personality traits, affect and perceived health, as operationalized by western psychology. These dimensions were assessed through self-report instruments in a sample of Italian adult participants.

To the best of our knowledge, no study has yet been conducted on this topic using this comparative approach. This work is thus exploratory in nature, and the findings represent a first step toward the development of a new research avenue.

QDAV and Prakṛti *assessment*

A specific questionnaire – QDAV – was developed to assess *Prakṛti*. The first version showed structural weaknesses. Five items did not allow for distinguishing between *Prakṛti* types: learning pattern, fat distribution, quality of relationships, meal schedule, and a synthetic description of mental features. Homogeneity in learning pattern could be related to participants' high level of education. As concerns fat distribution, other factors besides physical constitution can influence it, such as gender and age (in particular, menopause in women), lifestyle, diet and physical exercise. As concerns relationships, the item formulation could elicit socially desirable answers; moreover, this dimension may be sensitive to culture-specific values and norms. Sociocultural aspects can also influence the self-assessment of meal schedule: All participants worked full-time following structured daily routines. Finally, the formulation of the last item was inadequate: The three brief descriptions were very specific and not mutually exclusive. After removal of these items, QDAV-R allowed for a reasonably good differentiation between participants characterized by a relatively pure *Prakṛti*. The *Prakṛti* type distribution was consistent with findings obtained from other European samples, with a higher percentage of participants classified as *Pitta*. While no relevant demographic variations were detected across *Prakṛti* types, significant

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differences emerged for most QDAV-R items, concerning both physical and psychological functioning. These differences were in line with the Ayurveda literature on *doṣa Prakṛti*.

Prakṛti, *psychological features and perceived health*

Relevant consistencies were detected between *Prakṛti* features and psychological dimensions. As concerns personality, *Vāta* participants reported being less conscientious than *Pitta* and *Kapha* ones, less emotionally stable than *Kapha* participants but more open to experience than the other groups. The differences highlighted for these three factors were further confirmed at the item level, and they are substantially consistent with the description of these *Prakṛti* types in Ayurveda. Instead, the significant group differences detected in two items of the Agreeableness factor require further clarification, as they apparently contradict Ayurveda assumptions. *Kapha* participants reported significantly higher values that the other two groups for "I can be cold and aloof", while in the Ayurveda evaluation they are described as warm and affectionate. *Vata* participants scored significantly higher than *Pitta* and *Kapha* ones for "I am usually trusting", while Ayurveda describes them as distrustful and unreliable individuals with few close relations. These discrepancies can be explained taking into account the cultural context and demographic features of the participants. According to Ayurveda the healthiest and best constitution is *Kapha*: Its calmness, stability, and low activation are considered as positive traits in an Asian culture like the Indian one, that praises equipoise, self-control and detachment from passions. In today's Italian context – as in most western countries – the *Vata* features of improvisation, creativity, high activation and originality are encouraged and praised over stability and reliability. For this reason, *Kapha* participants in this study may perceive themselves as being sometimes cold and aloof (as stability and equipoise are interpreted in western terms). Similarly, the tendency to seek help from others to complete tasks and release ceaselessly fluctuating emotions may lead *Vata* participants to define themselves as trusting. As described in the previous pages, possible cultural variations in persons with the same *Prakṛti* are not ignored by Ayurveda, that classifies them as *Deśānupātinī Prakṛti*, individual traits derived from the sociocultural context.

The analysis of PANAS highlighted significant group differences for the variables alert and attentive, in which *Vāta* participants scored lower than the other two groups. This finding is consistent with Ayurveda literature, if we consider that PANAS variables are assessed as dispositional traits, rather than temporary states. According to Ayurveda, in *Vāta* individuals mental functioning shows high activation features in the short term, but its instability and fluctuations preclude sustained attention and alertness for prolonged periods. Also the significant group variation in Positive Affect, even though not confirmed by the post hoc pairwise comparisons, was consistent with *Prakṛti* profiles. Finally, participants across groups were substantially similar for the vast majority of self-reported health dimensions. This finding is not surprising, in that one of the original sample selection criteria was the enjoyment of good health conditions. Only one group difference emerged: Emotional problems were prominent among *Vāta* participants, in line with the findings obtained through BFI and Ayurveda assumptions.

Overall, for the majority of variables findings highlighted a clear distinction of the participants with predominance of *Vāta* features from the other two groups, in particular referring to stability and persistence at both behavioral and psychological levels. The most evident differences emerged for dimensions such as emotional instability, low perseverance in completing tasks, and the tendency to get distracted and upset. This result is conceptually grounded in the Ayurveda definition of the three profiles, in terms of both physiological features and pathological aspects. The three *doṣa* are conceived as entities whose material substrata are represented by the five basic elements, or *mahābhūta* – earth, water, fire, air, and ether. *Vāta* is made by air and ether, *Pitta* by fire and water, and *Kapha* by water and earth (Ćaraka Samḥitā, SūtraSthāna: 1, 57) [26]. Within this view, *Vāta* is thus structurally different from the other two *doṣa*, that share water as a common element. Moreover, both *Vāta* constituents are characterized by lightness and low density, thus being structurally unstable. These features are consistent with the physiological role of *Vāta* as the principle of mental and physical movement. At the pathological level, this intrinsic instability of *Vāta* is related to the tendency toward imbalance and thus disease. The classical texts ascribe to *Vāta* imbalance the origin of most pathologies, listing 80 diseases originated by *Vāta* alterations, 40 by *Pitta* and only 20 by *Kapha* imbalance (Ćaraka Samḥitā, SūtraSthāna: 20, 10) [26].

Strengths and limitations

The original contribution of this study consists of three aspects. The first one is the attempt to investigate, for the first time in the psychological and medical literature, the relationship between *Prakṛti* – the psychophysical constitution described in Ayurveda – and personality, its most similar western psychological construct, integrated by the assessment of emotional and physical health components in order to make the comparison as complete as possible. The second strength is the involvement of a reasonably large group of healthy adult participants, whose socio-demographic features were rather homogeneous. The third original aspect of this work is represented by the development of QDAV-R to assess *Prakṛti*. This instrument differs from most measures designed to this purpose, in that it is structured as a scaled questionnaire, in which each item assesses one specific feature across different *Prakṛti* types.

This pilot study also has several limitations. At the measurement level, QDAV-R requires further refinement through the inclusion of additional dimensions. Physiological processes such as digestion, sleep, metabolism, vulnerability to disease, and resistance to physical effort should be investigated. Emotional and motivational dimensions should be added to the prominently cognitive items referring to psychological functioning. Finally, since behavior-related items – such as cultivation of relationships and meal schedule – were confounding rather than helpful, a different set of behavioral variables should be identified. Another problem with QDAV-R is that items differed in structure and content – some were formulated as ordinal

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scales, and others as nominal categories. The investigation of the global statistical properties of the instrument was thus not possible. Moreover, due to the exploratory nature of this study, only participants with relatively pure *Prakṛti* were examined. Future studies should include individuals characterized by dual *Prakṛti*, derived from the combined predominance of two *doṣa* (e.g. *Vāta and Pitta*). Although most studies on *Prakṛti* involve single-*doṣa* types, the percentage of these individuals is relatively low in the general population, while dual *Prakṛti* types are much more common [43].

Another limitation related to measurement is the self-report nature of QDAV-R. A recommendation for future studies is to combine participants' self-assessment of *Prakṛti* with evaluations performed by expert Ayurveda clinicians, in order to verify consistencies and discrepancies between the two measurement approaches. From a biopsychosocial perspective, such a joint evaluation could provide a relevant contribution to our still limited understanding of the complex relationship between objective and subjective indicators of human functioning [44]. Finally, future studies should take into account cultural aspects. Behavioral and psychological features, besides characterizing a single individual, are related to the cultural context and value system the person is raised and lives in. They do not necessarily have the same meaning or value across cultures, and thus an invariant relation to health or individual adjustment [45,46]. This issue was indeed addressed in Ayurveda classical texts through the identification of collective *Prakṛti* types, including those related to the cultural and natural environment.

Future directions for research and intervention

The convergence detected between individuals' *Prakṛti* and psychological features has promising implications for research and practice. At the research level, the *Prakṛti* classification subsumes general morpho-physiological and psychological dimensions that can be profitably matched with the evaluation of more analytic constructs identified by psychology. The heuristic potential of the Ayurveda conceptualization of *Prakṛti* was confirmed by genetic studies, as well as by applications in veterinary science, in the study of birds, insects and plants. Overall, these studies showed its effectiveness in identifying properties of organisms throughout the animal kingdom, and not just among humans [47]. For this reason, the integration of Ayurveda basic concepts into the general assessments of individual features can be scientifically fruitful.

As concerns practical applications, this first attempt to classify people according to both their *Prakṛti* and psychological features shed light on the potential of integrating Ayurveda in health promotion, psychological diagnosis, and treatment. The joint investigation of *Prakṛti* and personality could pave the way to the development of a more integrated view of human functioning, joining apparently distant traditions of conceptual and empirical knowledge within a truly biopsychosocial approach to healthcare. Researchers and practitioners are becoming increasingly aware of the potentials of this integration, as witnessed by studies investigating physiological and psychological parameters together with measures of constitution derived from traditional systems of medicine, such as the Korean one [48,49]. In order to actualize these potentials, however, the biopsychosocial model must be translated into practice through theoretically grounded research and methodologically sound assessment. An authentically integrated intervention designed on this basis should foster individuals' psychological and social functioning, besides physical health [50–52].

The need for an integrated approach to treatment is even more relevant in psychotherapy, a domain that suffers from model fragmentation, theoretical confusion, and lack of clear-cut evidence-based outcomes. The numerous theories and models currently available in psychotherapy represent sealed-off compartments, leading to multiple definitions of well-being, each one grounded into a specific framework, but none of them capturing the complexity and multidimensionality of the concept [53]. Moreover, most psychotherapeutic approaches substantially neglect the body. The few clinical frameworks that take this into account – such as bioenergetics and psychosomatics – have not provided satisfactory intervention models yet. The availability of well-established knowledge traditions, grounded into a unitary view of the body-mind system, can open new avenues for designing integrated psychotherapeutic protocols.

As specifically concerns the integration of Ayurveda in medical diagnosis and treatment, it requires the development of more rigorous instruments for *Prakṛti* evaluation, that take into account both individual components and collective factors such as race, genetics, natural and cultural environment – as recommended in the classical texts. Most of the currently available textbooks address *Prakṛti* only at the descriptive level, and do not give practical diagnostic protocols or instruments, leaving this arduous task to practitioners. A better understanding of the concepts and descriptions of human functioning provided in Ayurvedic texts and a more systematic study of the way clinicians actually apply them in day to day practice will substantially improve our knowledge of this complex system of medicine and its integration in global healthcare.

Conclusion

The complexity of human behavior can hardly be captured through simplified paradigms, and the current state of the art in western science does not allow for a unified perspective yet. The tendency to polarize knowledge by contrasting universalism and relativism, objective data and self-reports, quality and quantity, holistic and reductionist frameworks cannot take researchers and practitioners very far in their attempts to provide an exhaustive description of human life and health [54]. However, the repeated claims for a biopsychosocial approach to health, and the recent acquisitions in physics and epigenetics support the crucial role of the dynamic interaction with the environment in shaping the structure of any system – be it an individual, a community, or a culture [5,55,56]. A constructive exchange and integration of views with other knowledge and medical traditions can represent a substantial step toward the achievement of this goal.

Conflict of interest statement

The authors declare that there is no conflict of interest.

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Appendix A. QDAV

We invite you to provide a description of some of your physical and psychological features. Please, for each feature put an "X" on the ***vertical mark*** that best corresponds to it.

1. My body structure is — slim, with tiny bones | medium | strong and sturdy, with big bones
2. My teeth are — irregular and/or extruding | regular and of medium size | regular, beautiful and big
3. My fingers are — long and slim | medium length | short
4. My neck is — thin | medium size | large
5. I suffer very much when the weather is — cold | hot | humid
6. My lips are — thin | fleshy and medium thickness | soft
7. My eyes are — small and dark | medium size, brown or light in colour | big, blue or dark
8. My skin is — thin and dry | pale and with many moles | tender and soft
9. I gain weight — around the waist | all over the body | easily, especially on buttocks and thigh
10. During childhood my body was — thin | normal | sturdy
11. My memory is — short | good | excellent
12. I tend to spend money — impulsively | carefully | with concern
13. I make decisions — with much difficulty | quickly | slowly but without regrets
14. I usually learn things — quickly | in average times | slowly
15. I usually eat — irregularly | regularly, I feel bad if I skip a meal | regularly, but I can easily skip a meal

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16. My style of thinking is mainly
imaginative and inventive | logical and rational | methodic and concrete

17. My circle of relationships is
broad, but I have few friends | selective friendships, some enemies | broad, with many friends

18. Usually my movements are
fast | precise and orderly | slow

19. In my daily organization I prefer
improvisation and change | planning and efficiency | order and routine

20. The adjectives that best describe me are: (*please, tick only one alternative*)
enthusiastic and lively ☐ | courageous and lover of challenges ☐ | calm and serene ☐

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