

Psychological Sketches
(The “What If?” Edition)

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Chapter 12

How to Capture What We Really Are? Core Methodological Issues in Personality Research

Jean-Baptiste Leca

WHAT is personality? We all often use—and sometimes misuse—this term. Among the myriad working definitions of personality (cf. Allport, 1937), let's just mention two of them because they are quite consensual. First, it is “a dynamic organization, inside the person, of psychophysical systems that create the person's characteristic patterns of behaviour, thoughts, and feelings” (Carver & Scheier, 2004, p. 5). This definition makes six important points about personality: (1) It is not just an accumulation of bits and pieces—it has organization; (2) It does not just lie there—it is active and has processes of some sort; (3) It is a psychological concept, but it is tied to the physical body; (4) It is a causal force—it helps determine how the person relates to the world; (5) It shows up in patterns—recurrences, consistencies; and (6) It is displayed not just in one way, but in many ways—behaviours, thoughts, feelings. Second, it is “an individual's unique constellation of consistent behavioural traits” (Weiten, 2001, p. 486). This definition makes three important points about personality: (1) Uniqueness—individuals differ from one another in behaviour in such a way that these behaviours can be described as individual

traits; (2) Constellation—individuals usually differ in correlated/clustered groups of behaviours; and (3) Consistency—an individual tends to act in similar ways over time and across contexts, situations, and measures.

Describing someone's personality is trying to capture the person's essence. When you think about the qualities that describe someone and what reveals those qualities to you, you are informally doing part of what personality psychologists do. There is some evidence that personality perception is an evolved ability we all share, probably because it allows for behavioural predictability (Larsen & Buss, 2013). According to Adams (1954), the best way to define personality is to examine our motives and intentions whenever we use the word "I". Indeed, when we say "I", we explicitly or implicitly provide information about ourselves: our likes and dislikes, hopes and fears, virtues and flaws, strengths and weaknesses. However, studying personality scientifically is far from intuitive or straightforward. The two overarching goals of personality psychologists are (1) to identify and describe personality through the development of methods by which individual patterns of behaviour can be measured and classified, and (2) to explain personality through the development of theories to account for the underlying causes of individual differences in behaviour. Here, I will focus on the first goal. Core methodological issues—pertaining to both the traditional field of human personality research and the more recent and booming field of animal personality research—consist in establishing how candidate personality traits are identified/selected, measured/extracted, and classified/grouped/analyzed.

12.1 How Are Candidate Personality Traits Identified and Selected?

Answering this question requires making decisions about the characteristics of the traits under study, including how they are defined, which hierarchical level(s) of the personality structure they belong to, and which of these traits are sampled as potentially personality-related ones. Let's briefly examine each of these three steps. First, defining personality traits can be tricky. Depending on the study and the species under consideration, "bold" may have different meanings from risk-taking to aggressive to fast and to emotionally unstable. In animal behavioural research, this is called the ethological fallacy, and in human research, it is referred to as the jingle-jangle fallacy. In other words, it is the erroneous assumption that two different traits are similar because they have similar labels, or

similar traits are different because they have different labels. To avoid such fallacies and truly determine whether personality traits in different species are similar, one should demonstrate that they predict the same outcomes or have the same causes.

Second, with regards to the hierarchical level, each personality trait, at any level, is structurally connected to the levels below and above it. For example, the maternal behavioural tendency can be considered a composite personality trait consisting of nursing, carrying, protecting, grooming, etc. Each of these behaviours can be defined as a measure of the composite “maternal” trait or an individual trait, depending on the research approach. If the research objective is to identify behavioural syndromes, it may be relevant to compare several lower-level traits for interdependence. If the research aims to examine the fitness consequences of a trait, starting the analysis from higher hierarchical levels may prove useful.

Third, among the various approaches to selecting candidate personality traits, the *nomination approach* relies on the human ability to choose appropriate traits based on our perception of variation in a specific animal taxon, including humans. In other words, this approach is based on human knowledge of the study species: the better the species’ behaviour is known, the more likely it is that meaningfully varying behaviours will be selected. As a result, the nomination approach typically allows researchers to name the candidate traits. The *adaptive approach* relies on the trait’s biological relevance to the ecology and evolution of the study species. Those traits with the most significant fitness consequences in the present and past of the study species are most likely to be selected. The *top-down approach* relies on personality traits found in other species (often humans) and seeks all-or-nothing similarities and differences with the study species; for example, does this particular species have the “conscientiousness” trait found in humans? The *bottom-up approach* focuses on the study species and investigates inter-individual differences in terms of naturally evolved building blocks and basic mechanisms of a particular personality trait; for example: what is the genetic basis of boldness in chimpanzees and how does it actually work? These approaches are not mutually exclusive and none of them produces an all-inclusive list of personality traits in any given study species. However, as long as researchers clearly state the approach they took to select candidate personality traits and are aware of the weaknesses of their method of selection, then comparison with other studies remains possible.

12.2 How Are the Selected Personality Traits Measured?

Broadly speaking, personality can be measured by using the trait-rating method or the behaviour-coding method (see Table 12.1). Trait-rating is a subjective assessment based on the rater's intuitive ability to mentally collate and hold information about the study subject (i.e., either the rater him/herself or another individual) based on a set of (non-)predefined traits, adjectives, or behavioural tendencies generally listed in questionnaires. Behaviour-coding consists in sampling and recording the subject's behavioural expression or mechanisms via direct or indirect observations. In human personality research, trait-rating is more often used, whereas behaviour-coding is preferred in animal personality research. Both methods typically rely on spontaneously-occurring or experimentally-induced behavioural patterns, even though the naturalistic expression of behaviour is more frequently used.

Of course, there are pros and cons for each method and each study design. For example, trait-rating is obviously faster than behaviour-coding, but trait-raters may tend to weigh salient events more than mundane ones, at least more than behaviour-coders do. Behaviour-coding seemingly makes the comparison of data across subjects more systematic and objective than trait-rating, but sometimes makes it harder to account for variability to due noise. Focusing on behavioural patterns that occur spontaneously (and, what's more, in natural settings) is supposedly more ecologically valid than inducing them in the context of experimental settings, but may be biased towards those behaviours or subjects that are more readily observable. Although behavioural tests allow researchers to control for certain variables, they are often based on behaviours that are limited in their duration. Not surprisingly, in experimental settings, behaviour-coding is generally more reliable and objective than trait-rating. However, when it comes to spontaneously-occurring behaviours, there is evidence that trait-rating can be quite reliable, practical, and actually less subjective than assumed. Whenever possible, different methods and designs should be combined in order to produce a fuller picture of the personality structure of the study subjects.

12.2.1 Trait-rating: subjective self-/other-reported data collected from questionnaires

There are two main methods for developing personality questionnaire items. First, the rational method relies on reason or theory to generate a

Measurement method	Type	Description	Data collected	Subjects
Trait rating	Subjective	Assessment based on the rater's intuitive ability to mentally collate and hold information about the subject on a set of (non-) predefined traits, adjectives, or behavioural tendencies via: <ul style="list-style-type: none"> - Interviews - Questionnaires/inventories 	<ul style="list-style-type: none"> - Self-reported data - Other-reported data (knowledgeable informants) - <i>S</i> or <i>E</i> 	human and nonhuman
Behaviour coding	Objective	Sampling and recording of the subject's behavioural expression or mechanisms: <ul style="list-style-type: none"> - Direct observations - Indirect observations (e.g., artefacts, life records, physiology) 	<ul style="list-style-type: none"> - Behavioural data - Physiological data - <i>S</i> or <i>E</i> 	human and nonhuman
Behaviour coding	Projective	Presenting the subject with an unstructured or ambiguous stimulus and asking him/her to "project" a meaning into it	<ul style="list-style-type: none"> - Verbal accounts - Drawing accounts - <i>E</i> 	human

Table 12.1: Measurement methods, types, and data collected (*S*: Spontaneously occurring, *E*: Experimentally occurring) in personality research.

list of questions. It is also referred to as the “face valid method” because the trait being measured is clearly stated in the question, which can be taken at face value. For example, in order to develop a questionnaire item measuring anxiety, researchers using this method would ask “I feel anxious much of the time (True/False)”. Advantageously, there is no need to conduct preliminary studies to help differentiate anxious and non-anxious subjects on the basis of this new item, because the question is supposed to do just that. The problem with such transparent questions is that subjects might be inclined to give socially desirable (hence untrue) answers rather than honest ones. Second, the empirical method relies on questions which, based on previous research, proved to differentiate the group of subjects that the questionnaire is intended to differentiate. For example, if preliminary studies showed that the item “I prefer baths over showers” is answered in a certain way by anxious people and in a different way by non-anxious people, it can be used as measure of anxiety. The advantage of such non-transparent questions is that subjects are less prone to dishonesty. However, this method requires preliminary studies to relate to such specific questionnaire items, as well as an outside criterion, like a therapist’s evaluation about which subjects are anxious and not anxious.

There is a large range of personality questionnaires (e.g., the 5 NEO PI-R, which is a 240-item measure of the Big Five personality domains, each divided into multiple facets, the Cattell’s 16-Personality Factors, the California Psychological Inventory, and the HEXACO). Typical answers to these questionnaires require either a binary choice (True/False) or an ordinal multiple choice (Likert scale). Data pertaining to personality questionnaires are either self-reported or other-reported. In the latter case (a.k.a. “mother reports”), the list of questions is answered by informants who are knowledgeable about the study subject. For human subjects, they typically include parents, peers, teachers, and clinicians. For animal subjects, they are typically ethologists, zoo keepers, animal care-takers, or pet owners.

Even though several pop-psych tests of so-called “personality types” (e.g., the Myers-Briggs Type Indicator) are extensively used by the personality assessment industry and taken by people applying for jobs, dealing with drug addiction, or being disloyal, they are generally disregarded from a scientific viewpoint. Indeed, most of them are unrepeatably—less than half of the subjects scored the same a few weeks apart—and invalid—there is little evidence that the personality types obtained actually predict specific behavioural patterns in terms of professional and personal qualities. Likewise, even though astrology, fortune telling, and even graphology are advertised and often believed to hold the key of some of our personality

traits, they suffer from the Barnum effect¹, named after the showman and businessman P. T. Barnum's observation that a successful formula should have "a little something for everybody". In other words, the all-purpose and generally flattering astrological descriptions and predictions are vague enough to potentially apply to anyone, but prove to generate unscientific personality profiles because they are unfalsifiable (i.e., almost impossible to disprove), unreliable (i.e., inconsistent across raters), unrepeatable (i.e., inconsistent over time for the same subject), and invalid (i.e., useless for behavioural predictions).

12.2.2 Behaviour-coding: objective behavioural data obtained from direct or indirect observations

Personality researchers using the behaviour-coding method sample and record the subjects' behavioural expression and/or its underlying physiological mechanisms. Data on spontaneously-occurring or experimentally-induced behaviours are collected from direct observations via the traditional sampling and recording rules followed in ethology (cf. Altman, 1974). Sampling rules focus on who is recorded and how, and include focal-animal, group-scan, and behaviour-dependent sampling techniques. Recording rules deal with when the behavioural patterns are recorded, and are divided into time sampling and continuous recording rules (Martin & Bateson, 1993).

Selecting the best combination of sampling and recording rules is a trade-off, bearing in mind that attempts at recording everything often result in unreliable and unrepeatable behavioural records. Common behavioural tests of personality in animals typically involve exposing them to novel environments (e.g., open-field test), novel objects (e.g., mirror test), or other challenging situations (e.g., test of resistance to handlers, trap-pability test, tonic immobility test, predator presentation test, separation test) designed to assess their reactivity (e.g., neophobic versus exploratory behavioural tendencies), boldness/shyness, and aggressiveness/sociability. Such tests have various practical implications for animal welfare and zoo management plans.

Indirect observations of personality traits may be obtained from life records, behavioural artefacts, and physiological data. Personality profiling aims to assess human personality traits based on indirect behavioural evidence (i.e., behavioural artefacts). As such, the expression of our per-

¹Also known as the "Forer" effect, see Forer (1949).

sonality would leave a variety of relevant traces in different types of environments: (1) physical environments (e.g., our bedrooms and offices), (2) real-world social and leisure-related environments (e.g., the kind of music we listen to, books we read, movies we watch, food we eat, pets we choose), and (3) virtual environments (e.g., the layout and contents of our webpages and online social network interfaces). In the latter case, a study showed that variables such as the number of Facebook friends reported, the time spent commenting on another person's Facebook page, and the frequency of adding on Facebook photos of oneself pictured with others were positively correlated with extraversion, whereas the number of hours per week spent on Facebook and the frequency of viewing one's own Facebook page were negatively correlated with conscientiousness (Gosling, Augustine, Vazire, Holtzman, & Gaddis, 2011).

With regards to behavioural artefacts from the physical environment, the careful and systematic coding of college students' dormitory rooms (in their absence) allowed researchers to produce good assessments of the occupants on particular personality traits (e.g., conscientiousness and openness to new experience; Gosling et al., 2011). The long list of coded cues included the degree of tidiness of the desk, the level of lighting in the room, the cheerfulness of the décor, as well as the number and diversity of the books). On the basis of this study (justifiably entitled: "A room with a cue"), Gosling et al. (2011) found evidence for four processes. First, cue validity: certain cues provided good information about the occupant's real conscientiousness, as measured by the combined self- and peer-reported trait-ratings. Second, cue utilization: certain cues used by the coders allowed them to infer specific behavioural expressions of the occupant (e.g., hard work, organizational skills, punctuality), which in turn, translated into the occupant's score of conscientiousness. Third, functional achievement (or observer accuracy): there was a good match between the occupant's real conscientiousness measured by self- and peer-ratings and the occupant's score of conscientiousness obtained from cues. Fourth, reliability: there was a good inter-coder agreement on the occupant's score of conscientiousness obtained from cues.

Another objective way to measure personality-related traits is to explore the physiological mechanisms indicative of the level of arousal, reactivity of various stimuli, and speed at which information is taken by the subjects. These physiological measures include blood pressure, heart rate, skin conductance, muscle contraction, and brain functioning. For example, the eye-blink startle reflex allows for the distinction between "normal" people and psychopaths (Filion, Dawson, & Schell, 1998). Functional MRI

studies showed that the visual perception of emotion-laden words, such as “maggot” or “cancer”, resulted in the activation of brain areas associated with feelings and self-control in “normal” people, whereas the brain of subjects with antisocial personality disorder remained inactive (Hare & Neumann, 2009).

12.2.3 Behaviour-coding: projective tests based on verbal accounts and drawings

During projective tests of personality, human subjects are presented with unstructured or ambiguous stimuli and asked to talk about them or draw them, i.e. to “project” a meaning into them. The assumption underlying these tests is simple: by providing a definition or description of stimuli where none exists in reality, the subjects will fill in the gaps in a way that expressed some of their characteristic patterns of thinking, feeling, and regulating emotions (i.e., their personality traits).

There are several well-known projective tests. The Rorschach test consists in the presentation of 10 cards, each with a bilaterally symmetric inkblot, followed by the instruction: “Tell me what this might be”. It is probably less what the subjects actually see in the inkblot than the aspects of the inkblots (i.e., form, colour, location) triggering their responses that provide insight into their subconscious perceptual, cognitive, and emotional processes. In the Thematic Apperception Test, the subjects are asked to make up stories about a series of ambiguous drawings, most of which depict people interacting. Here, it is assumed that by eliminating the ambiguity, the subjects will create stories that reflect their own recurrent wishes, fears, and ways of experiencing social relationships. This test is often used to detect subjects with borderline personality disorders, which typically manifest themselves in unstable relationships, repeated suicide attempts, and difficulty controlling rage, anxiety, and sadness.

On the positive side, projective tests show high levels of reliability and validity for particular purposes, i.e., assessing psychological disturbances and distinguishing patients based on personality disorders. However, they suffer from several weaknesses. They are often less useful in predicting behaviour than simple demographic data (e.g., age, sex, and socio-economic class). They are often used idiosyncratically by clinicians who provide different interpretations of the same response. They are also often misused to make predictions about behaviours for which these tests are not valid (e.g., potential job performance).

12.3 How Are the Selected Personality Traits Analyzed?

Here, I will only focus on the data analyses related to personality trait theories. A rather subjective method allows researchers to extract a few central traits (proposed by Gordon Allport) from the many surface traits (proposed by Raymond Cattell). An objective but improvable method (called “overlapping factor analysis”) can produce source traits (a.k.a. the “16 personality factors”) from surface traits. Finally, an objective and powerful method (called “non-overlapping factor analysis”) can turn surface traits into hierarchical and nested personality structures like the Three Primary Personality Dimensions (Eysenck & Eysenck, 1985), the Five Factor Model (McCrae & Costa, 1997), and a few other personality models (cf. Bouchard & Loehlin, 2001).

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