

THEORY OF PERSONALITY: AN INTERACTIVE BEHAVIORAL APPROACH¹.

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Abstract

The present article shows the behavioral perspective of the personality. The authors have tried to formalize a theory of personality from the interactionist perspective. We have summarized the works of European and American authors of the last 50 years committed to measuring personality in an objective manner.

Starting from the pioneering works of Cattell in which he laid the foundations of the objective measure of personality, the psychologists of interactionist behavioral orientation, have proposed to measure personality and motivation in the same way as aptitudes. A personality theory is presented that establishes that the different learning processes in situations of *open contingencies* incorporate consistent response tendencies of individuals.

We consider that the personality is the synthesis, in each moment, of the tendencies of response that have been consolidated throughout the development. We think that personality does not refer to the descriptions of people about themselves. Individuals often reflect on their own experience and deduce rules that govern, to a large extent, their behavior. Both the response tendencies (interactive styles) and the rules that govern the behavior in a specific situation and moment, constitute the personality of the individuals.

In this article, the authors present a general theory of behavior from the interactionist perspective. Subsequently, they present the objective measurement procedures and propose a new theory of personality. This proposal allows to combine the experimental and correlational perspective of the personality.

Resumen

El presente artículo muestra la perspectiva conductual de la personalidad. Los autores han intentado formalizar una teoría de la personalidad desde la perspectiva interaccionista. Hemos resumido los trabajos de autores europeos y americanos de los últimos 50 años empeñados en medir la personalidad de manera objetiva.

Partiendo de los trabajos pioneros de Cattell en los que sentó las bases de la medida objetiva de la personalidad, los psicólogos de orientación conductual interaccionista, han propuesto medir la personalidad y la motivación del mismo modo que las aptitudes. Se presenta una teoría de la personalidad que establece que los diferentes procesos de aprendizaje en situaciones de contingencias abiertas incorporan tendencias de respuesta consistentes de los individuos.

Consideramos que la personalidad es la síntesis, en cada momento, de las tendencias de respuesta que se han consolidado a lo largo del desarrollo. Pensamos que la personalidad no se refiere a las descripciones de las personas sobre si mismas. Los individuos reflexionan frecuentemente sobre su propia experiencia y deducen reglas que gobiernan, en buena medida, su comportamiento. Tanto las tendencias de respuesta (estilos interactivos) como las reglas que gobiernan la conducta en una situación y momento específico, constituyen la personalidad de los individuos.

En este artículo los autores exponen una teoría general del comportamiento desde la perspectiva interaccionista. Posteriormente, presentan los procedimientos de medida objetivos y, proponen una nueva teoría de la personalidad. Esta propuesta permite aunar la perspectiva experimental y correlacional de la personalidad.

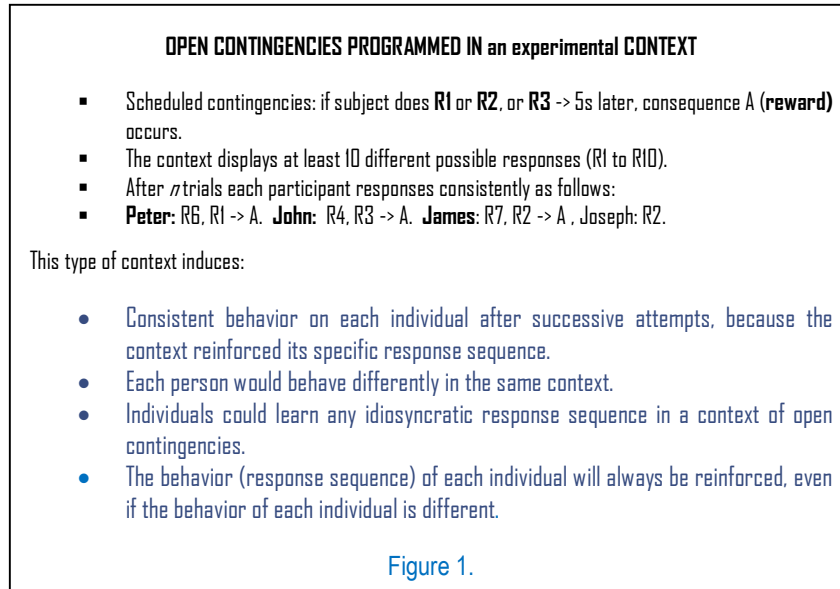
¹ This text complements the T-data entry of the *Encyclopedia of Personality and Individual Differences* (V. Zeigler-Hill, T.K. Shackelford, eds.). Springer.

1. **Definition.**

Behavioral personality psychology studies the idiosyncratic behavioral tendencies of individuals in specific open contingencies contexts that generate individual differences. The open contingencies contexts, as opposed to closed contingencies, allow associating different response patterns with the desired consequence. The behavioral tendencies of each individual are relatively consistent and

context at a given moment are of such importance, that are what really determines the behaviour of an individual.

The original approach of the behaviourist perspective states that behaviour is a function of the context contingencies and individual's behaviour variability in a specific context is due, exclusively, to procedural error control. However, in laboratory, researchers frequently found individuals behaviour differences that could not be explained by



stable behaviors consolidated throughout the development of each individual.

2. **Introduction.**2.1. *Psychology of Personality and personality of individuals.*

Contingencies operating on the context changes the behaviour frequency on successive trials. Individual's Personality refers the specific behaviour showed in a context that contingencies operating are not perceptible or detectable. Therefore, the particular behaviour in such situations can only depend on the person's variables. Such specific contexts shows important differences in individual's behaviour (the value of SD is large with respect to the mean). Thus, the Personality Psychology studies the behaviour in a type of contexts in which each individual behave in a different manner but their behaviour is probably consistent and stable.

Personality psychologists propose that, individuals show their own personality, when their behaviours are consistent and stable in many important adaptive contexts. For example, an individual shows a risky personality if, in a risk and controlled context, he systematically chooses the option that is less probable but leads to a greater reward or a minor loss. A risk and controlled context could be a task in which there are at least two response options with a different probability of success and the same expected value. Other context variables determine the choice. For instance, knowing, the number of times an individual could choose, the amount obtained in previous elections, the time available to decide or what the other participants choose. On the contrary, a real uncontrolled situation, such as crossing a street, is not a good test to measure the risk tendency. In the moment of crossing a street, the contingencies of the situation are the variables that best explain the behaviour: A person does not cross the street if he sees a vehicle coming at high speed, regardless of his personality (of his tendency to take risks). Thus, in most situations of daily life, the contingencies that operate in the

procedural variations or control errors. For instance, in extinction operant situations, many cases of individual differences have not found experimental control errors (Odum, Ward, Barnes & Burke, 2006). Neuringer and his group (Neuringer and Jensen, 2010) have reviewed a large number of controlled operant contexts that generate greater variability in individual's responses and, surprisingly, individuals shown a certain degree of consistency in their behaviour. (See Figure 1)

These authors have also achieved a large response variability in laboratory animals by reinforcement. Santacreu (2013) has explored how certain contexts induce individual behaviour differences at the same time as these context or tasks induce behaviour consistency in each individual. This type of context has been called by Harzem (1984) "open contingencies contexts".

Therefore, in open contingencies contexts, individuals fail to know the contingencies strictly programmed by the experimenter. However, individuals, in such contexts, always achieve the reinforcing consequences, but do not know what is the necessary and sufficient behavior to achieve the reward. There are numerous natural settings where individuals do not know why but know how to get the desired results, despite their long experience in these contexts and their success to achieve the desired results. In the aforementioned contexts, individuals systematically repeat the sequence of behaviors that were rewarded in previous trials.

Thus, the *Behavioural Theory of Personality* proposes to study the personality of individuals, in open contingencies contexts. To do this, we must define the context of open contingencies represented by the personality variable that we intend to study. That is, a context that initially shows the same rewards expected for each of the different response options, regardless of whether all the people reach to know, if they achieve the expected reward.

2.1.1. *The development of individual personality.*

All behaviorists assume that behaviour is a function of the context contingencies and that behaviour in that context is reversible. Most behavioural psychologists also share the ideas that: a) the behaviour is the interaction between the person and the context and b) the individual behaviour in a specific time and situation depends, in part, on their previous history. Staddon & Cerutti, (2003) point out that behaviour is generally reversible by changing context contingencies but people are not reversible. The effect of learning remains even when other subsequent learning invalidates previously learned. The majority of behavioural

development. Each individual incorporates all the experience of his life sequentially, so the earliest experiences influence the later ones (Wachs, & Gruen, (2012) In addition, the person reflect over their own experiences and reorganizes them synthesizing them to be able to act in other situations in future moments. Thus, individuals show their own synthesis through the behavioural trends for each specific context. Moreover, without this synthesis, it would be difficult for anyone to react and behave, in different contexts in an adaptively and effective way. We postulate that If anyone frequently solves

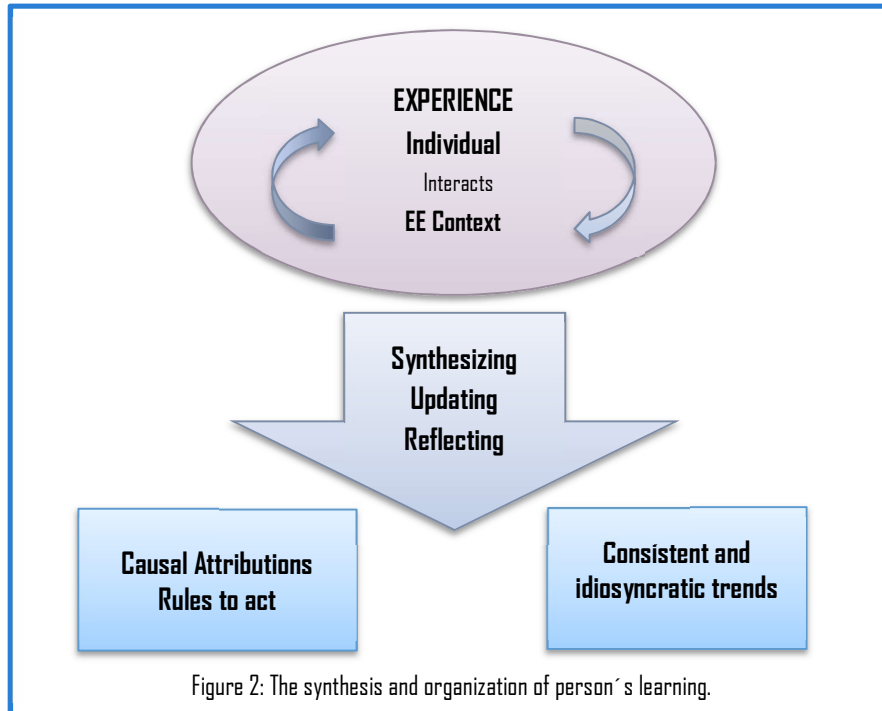


Figure 2: The synthesis and organization of person's learning.

psychologists (including Skinner) have recognized the importance of the history of learning in the present behaviour. However, in most of their studies the present experience has had greater relevance than the behavioural tendencies originated from the history of the individual (Ferster & Skinner, 1957; Morse & Kelleher, 1977). Behaviourist authors studied the process of learning, and explained how change individual behaviour. However, some authors, from the behavioural tradition, such as Bandura and Staats, introduce the concept of behaviour tendencies as an essential element in the equation. We refer to the model of reciprocal determinism (Bandura, 1977) or to the concept of the basic behavioral repertoire (BBR) (Staats, 1975, 1996).

Psychologists considered that individuals develop their personality from the embryonic phase until adulthood. The behavioural theory of personality highlights the role of learning and, therefore, considers that children interact with their environment, throughout their development. Children are learning and frequently are revising their experience, integrating and synthesizing what is learned. This integration and synthesis of personal experience allows individual to modulate the probability of their behaviours in any subsequent experience. The individual generates response trends that allow them to respond quickly and efficiently in similar contexts.

2.1.2. *The human being, a system that learns and updates its experience: The evolutionary development of the person.*

From a psychological perspective, a person is, at a given moment, the synthesis of his epigenetic and ontogenetic

a task in a meticulous and adaptive. The differences between people at present are a consequence of their successive and previous experiences. Therefore, behavioral differences are a function of, a) the different contexts in which each person has lived; b) the sequence with which everyone has faced the different contexts and, consequently, c) the moment, the way and depth with which people have reflected, reorganized and synthesized their previous experience in order to update the data and respond to a new situation (Santacreu et al, 2002).

The previous experience and their synthetic organization of learned determine the probability of person's behaviours. As mentioned, each individual organizes their experience by reflecting on it, reducing contradictions as much as possible, and synthesizing all experience in a) *behavioral tendencies* that allow rapid response in a specific situation and b) *coherent rules* that could verbally expressed and could governed their behaviour (see Figure 2).

Behavioral tendencies allow people to respond as quickly as the situation demands, according to their motivations in a context or task. The rules also allow each person the rules allow to analyze, reflect and decide coherently what to do when the person has enough time for it. On the other hand, the rules allow explaining to other people, the reasons that justify their performance (Santacreu et al, 2002). In a way, the information provided by self-reports on personality traits, constitute a verbal synthesis of the experience of each individual. Sometimes, the examinee answers in self-reports are an evaluation of themselves with respect to a personality dimension. For example when they say: *I am a very honest person or I am extremely risky in gambling* (see Figure 3).

2.1.3. *The different types of learning as systems to adding the personal and social experience.*

Each individual updates his experience, in any interaction with the context, through different types of learning. We considered different types of learning, non-associative, perceptive, associative, by observation of others, through verbal instructions of others. Individuals learn by interaction with different contexts in which the individual is alone or with other people who collaborate, teach or compete for scarce resources or in situations, where there are people who can control the contingencies of the context in different degrees. The different learnings and the previous knowledge of each individual, determine the subsequent effect of the new interaction in each context. The people life experience and the consequent learning, let them accumulating knowledge about the world around them, about the behaviour of others and about their own

global magnitude of the expected value and loss or profit contexts variables, influence the decision.

Therefore, to study the personality, it would be necessary to identify equivalent contexts in which individuals respond in a consistent and stable manner. The set of contexts that synthesizes a certain number of personality dimensions has not been described exhaustively so far (Santacreu, 2013). This may be due to the specificity of the contexts usual for each individual and the large number of the potentially relevant contexts to assess any behavioural tendency. However, in the field of education and in the field of human resources, psychologists have been able to define numerous potentially relevant contexts for the prediction of educational or business success.

2.1.4. *Response trends and rules as systems to synthesizing and updating of experience.*

How to explain the idiosyncratic and consistent behavior of individuals?

People interact with their environment ...

Step 1: Each person interacts in different environments.

Step 2: Everyone learns and reorganizes their own experience frequently

Step 3: Each one reflects, and summarizes his own experience reducing contradictions.

Individuals generate

- a. *Behavioral tendencies* allow individual to respond quickly.
- b. *Coherent rules* that could verbally expressed and governed their behaviors.

Figure 3: Developing Individuals Personality

behaviour. That knowledge affect how they respond in present and future situations (Bandura, 1977; Beck, 1967). Psychologists have organized the personality of the individual as a large number of variables grouped into factors. The most modern version of this proposal is based on the lexical approach (McCrae and Costa, 1990). To assess personality dimensions, psychologists have used questionnaires with questions about the participants' habitual behavior, beliefs and expectations. The objective of this approach is to describe the personality structure, classify an individual according to their normative reference group in each of the dimensions of the personality and predict their future behavior. The procedure consists of analyzing the answers to different questionnaires, trying to know the rules that govern their behavior. This personality approach tries to find out what is the verbal synthesis that each person makes of his or her own experience.

However, until now, there is hardly any models of how tendencies of response are structured conforming individuals personality. Behavioral models of personality come from the initial formulations of Kantor's interactionist psychology (Kantor (1959). The subsequent personality approaches of Harzem (1984), Ribes (1990, Ribes and Sánchez, 1992) Hernández, Santacreu and Rubio (1999) and Santacreu (2013) try to identify the consistent and stable behaviour of individuals (response tendencies) in different and functionally equivalent situations. They assume that, in any functionally equivalent context, each individual would take the same option. For instance, each individual would take the same level of risk in all equivalent risk contexts, in which there were response options of different probability and equal expected values. As Kahneman showed, the

The study of personality let us to predict behaviour in future new situations. Surely, people behave according to what they have learned in a context, generalizing and transferring what they have learned to similar contexts. However, all people do not behave in the same way in a particular context and, therefore, they did not learned the same relations. As mentioned previously, some contexts induce variability in individual's behaviour. It means that, each one performed the task behaving in his or her personal manner and gets their desired benefits of the context. The contexts that allow wide behaviour individuals variability are those that relationship between a certain behaviour and the expected consequence must be greater than zero but less than one. Therefore, different people who perform different behaviors, achieve, in this context, a similar success rate. The contexts in which more than one response is related to the desired consequence induce response variability among individuals but consistency in their own behaviour (Santacreu, 2013). We recommended that kind of contexts to study personality. Contexts in which we can predict the behaviour of an individual as a function of their idiosyncratic response tendencies, that is, their personality.

The behavioral theory of personality has proposed that the particular response trends of an individual are conformed because the context contingencies reinforce the behavior that constitute their idiosyncratic response. But the really important thing is that, in a large part of the contexts in which we live, each individual can perform a different behavior that, finally, is reinforced because it is associated with the preset consequence in that context. As a result, in a context in which the consequence is pre-established, each individual performs those types of responses that have been personally reinforced in the past and, therefore, reduces the

frequency of other alternative responses of which he has no record of his effectiveness. How is it possible that, after extensive experience and numerous trials, different people behave differently in a context in which a specific contingency relationship is predefined?

To explain this contradictory and incoherent description, let us suppose that we are in a context in which, after a certain time, any response (even not responding) is reinforced. Imagine a TV that automatically switches off when it reaches a certain temperature, and reconnects when it cools to 0.5 ° C. The TV users do not know why the device is turned off and try to solve the problem in various ways. Some people turn off the device and after a while they turn it on again, others hit it on its right side, others check the electric plug, some complain about the quality of the device. All these answers apparently solve the problem since, after a certain time, the device by itself turns on again. Finally, we can observe that all people consistently repeat the same patterns of behavior that they have done the first time. We must consider that, probably, the contingencies of the context have reinforced the idiosyncratic behavior of each individual. For this reason, the next time the device shuts down on its own, people will repeat their behavior. This example reminds us of the research carried out by [Staddon & Simmelhag, \(1971\)](#) analyzing the famous Skinner experiment on superstitious behavior.

The multiple versions of attribution theory highlight the differences between the relationships that actually operate in a context or task and the people beliefs about the causes that explain their own failure or success, solving the task. This theory emphasizes the importance that individuals ascribing achievement in a task to themselves or, conversely, to circumstances external to themselves. This explanation refers to internal or external attribution respectively ([Heider, 1958](#); [Rotter, 1966](#)). The type of individual's attribution will allow us to understand and predict their behaviour. Therefore, we conclude that in those contexts in which different individuals achieve the same success rate showing different behaviors, individual response tendencies and idiosyncratic causal attributions will be formed. These are the appropriate contexts for the study the personality development.

People face situations daily in which they do not know the relationships that operate in them, in which there are several potentially successful alternatives, and individuals must answered in a limited time. In these situations, each individual has a way of responding that can be recognized and described as personal and idiosyncratic and, therefore, attributable to their personality. The urgency of the answer and its temporal delimitation are undoubtedly variables that help to synthesize behavioural trends and verbal rules that, finally, facilitate the individual's adaptation to their environment.

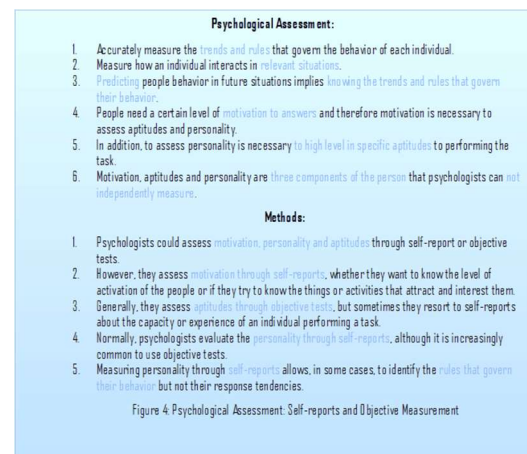
3. The personality assessment as a predictive tool.

To study the personality of each individual we could measure, through a test, their behavioural tendencies or we could also inquire, through a self-report, about the statements or rules that describe their behaviour in one or other situations. We frequently say that adults show personality because in a large number of contexts, each one of them shows idiosyncratic, consistent and stable behaviours. If the behaviours observed do not meet these requirements, we affirm that such behaviours should not be explained by their personality.

We have emphasized that to evaluate personality, contexts, tasks or tests must not show an explicit or known relationship between behaviours and consequence. In this way, we will observe the individual differences in the test. Therefore, if in a context or test there are no individual differences in behavior (in this context, all people perform

similar behaviors) the behaviors performed by these individuals would be a function of contextual contingencies or also of the competencies and aptitudes of each person. On the other hand, in those contexts in which we observe individuals' behavioural variability, the lack of consistency and stability in the behaviour of an individual, indicates that this individual has not consolidated a response pattern. In other words, an individual who does not show a response pattern (consistent and stable) in a specific situation or test, is because he has no experience in that type of context or that his idiosyncratic behavior in the test has not been able to solve it. In this case, psychologists can not assess personality.

Recently, the behavioral theory of personality assumes Cattell previous work about the evolutionary structure of the personality ([Ortner & Proyer, 2015](#)). Now, to assess the personality by an objective test it is necessary to check three points. First, the distribution of the test scores for the examinees should be broad, that is, be quite different. Second, the participant must have enough motivation to face the resolution of the task, then if there are not answers it is not possible to carry out the assessment. Third, the person must be able to perform the behaviour relevant to assess personality. Therefore, motivation, aptitudes and personality are three components of the person that psychologists can not independently measure. Without a certain level of motivation, it is not possible to assess the aptitude or ability. In addition, without a high level in both motivation and aptitude performing the task, it is not possible to assess personality (see Figure 4).



3.1.1. Motivation, Aptitudes and Personality.

The motivation has been studied as the set of elements of a context by which the individual has preference at a given time. The preference for some elements of the context brings the individual to increase those behaviors that achieve the desired stimuli to the detriment of the less desired ones. The most concise expression of this approach is the so-called Premack Principle ([Knapp, 1976](#)). Motivation, as a preference for certain contexts (sets of elements, people or relationships) increases with the passage of time without rewarding activity until reaching a certain level and it is reduced, as the actions of the individual satisfy the preferred desires.

Researchers described *Motivation* in terms of the state of activation of organisms. In this sense, an indicator of this motivation would be the overall response rate (number of responses / time) so that the greater the activation (and, therefore, the motivation), the greater the overall response rate in that particular context. Both approaches (preference for some elements of the context and response speed of the individual) are complementary visions from the perspective

of the context or the individual. Both approaches consider

instructions easy to understand. For example, to design

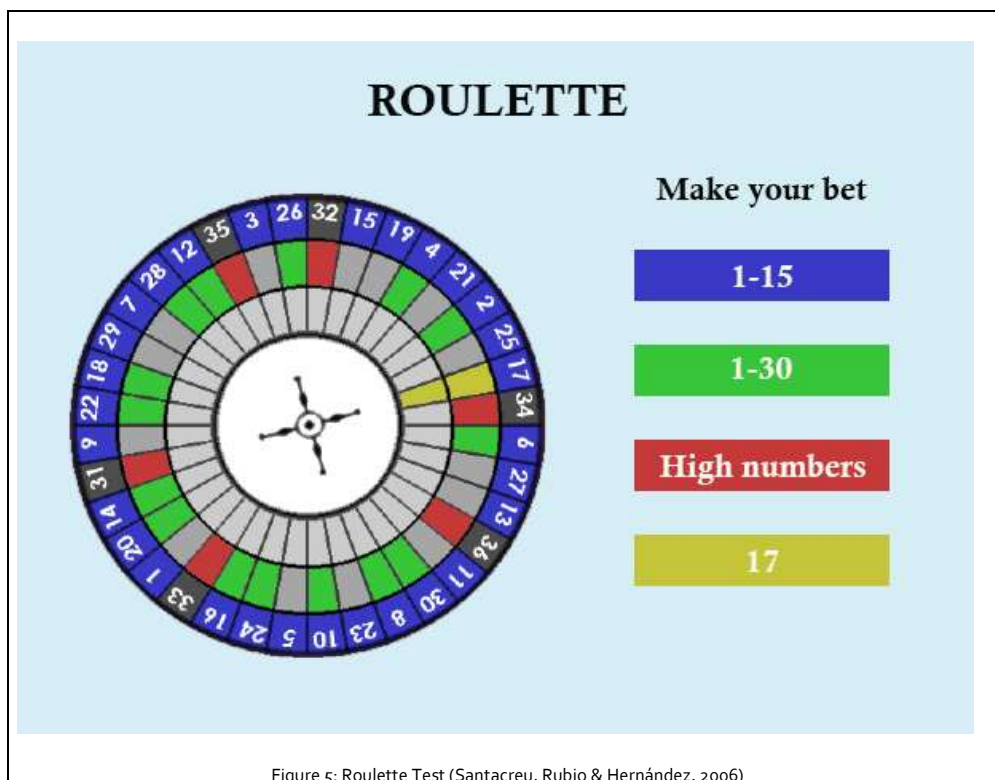


Figure 5: Roulette Test (Santacreu, Rubio & Hernández, 2006)

that a minimum level of activation of the individual is essential to respond effectively. If, on the other hand, the general response rate was very low and there was no activity, psychologists can not measure the behavior of the individual. For these reasons, we say that motivation induce behaviour and allows the subject-context interaction.

Aptitudes refer to competences or skills learned throughout the individual evolutionary process that allow universal and rapid responses in a specific context. Examples of aptitudes are calculating the speed of an object approaching, deducting a solution, knowing the total expense of the purchase or turning on the lamp in a room. Skills refer to the learning of stable and equal to unity relationships between behavior and consequence ($K = 1$), which can be described verbally. During the process of aptitude learning, verbally describing the rule, instruction or contingency relationship, facilitates learning. When the person reaches a high degree of competence, the response speed increases. Having certain aptitudes enables interaction that would otherwise be impossible. So for example, if an individual knows how to drive (he is able to drive a vehicle where he wants and knows the traffic rules) we can measure his tendency to violate traffic regulations when driving in a city. On the other hand, if he or she does not know the traffic rules, he/she could violate some rules due to ignorance, without intending to violate the norm. In summary, measuring transgressions of the traffic code could not be a good estimate of the tendency to transgress in those people who do not know the rules and do not have a driving license. In short, the aptitudes enable to asses personality (Hernández, Santacreu and Rubio, 1999).

3.1.2. The basic elements of the tests and self-reports.

The behavioral psychology of the personality, aims to predict through a test, what will be the behavior trend of an individual in a set of functionally similar situations. As we have previously suggested, in order to measuring the personality through a test, the examinee should be competent to face the task and be motivated to do it. Therefore, it is convenient that the task is simple and the

functionally similar tests to assess risk, the tasks should allow the individual to choose between different probability options, referred to buying stocks, choosing between different job offers or betting on roulette. The behavioral psychology proposes to assess the individual's personality through objective tests in the same way in which the aptitudes are measured (see Figure 5).

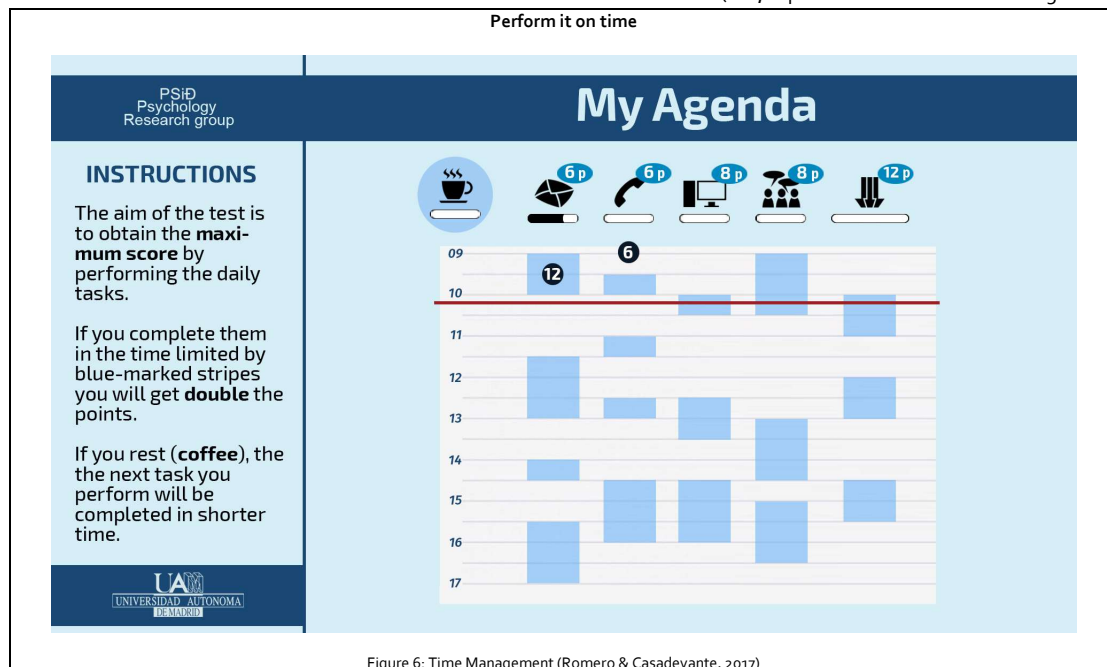
In order to check the aptitude or ability of the examinee, psychologists designed objective tests. Therefore, to know if a person can do certain mathematical operations or travel by bicycle, the examiner applies an appropriate test for it. In the first case, it includes solving mathematical operations and in the second, cycling in a trial circuit. A basic mathematical operations test does not assure that in the next addition, the individual will make an error but it suggests the level of knowledge of maths and the probability that he will make an error. In a sense, the term aptitude refers to the ability to carry out a task or the possibility of carrying it out successfully. Psychologists have developed numerous tests to measure each of the spatial, reasoning and verbal aptitudes.

In the same way, to assess the personality from a behavioral perspective, we must design contexts or tasks that allow measuring the different personality dimensions. Thus, in each of these situations we can evaluate the behavioral tendencies of each of the individuals. Thus, for example, in a context of low reward rate, we can measure the degree of persistence of individuals while, in a context with options of different probability and equal expected value, we can measure the risk tendency of individuals.

Cattell and Schuerger (1978) have described the main procedures for assessing personality through objective tests. Recently, some authors, following the recommendations of Cattell and his group, have designed computerized personality tests according to the behavioral approach. These authors have designed computer tests that represent assorted contexts and that allow the automatic

recording of the evaluated behaviour (Rubio, Hernández, Zaldívar, Márquez, & Santacreu, 2010; Proyer & Häusler, 2007; Ortner & Proyer, 2015).

From the behavioral perspective, we propose to organize the personality structure from two different perspectives: in terms of the set of contexts that describe personality dimensions (risk, persistence or time-management



On the other hand, a person can describe verbally his behavioural tendencies, especially if the person has reflected on their habitual and particular way of behaving. In clinical contexts in which people want professional help, the answers to an interview questions about how the person usually behaves does not present great problems except the difficulties of verbal communication. When psychologist used self-reports for other purposes such as recruitment processes, the individual's responses are biased according to socio-cultural values and, in addition, people can try to hide the truth. Robie, Born, & Schmit, (2001). The trait psychology have repeatedly addressed procedures to resolve the validity problems of self-reports without much success in personality assessment. However, what people say about their own behaviour through a questionnaire does not match with what they usually do, even when they do not pretend to lie. These controversies have recently promoted the design of objective and computerized tests to assess personality.

4. The behavioural perspective of personality structure.

There is no agreement on how to proceed to define the structure of an individual's personality from the Behavioral Personality Theory. The lexical approach initiated by Cattell and developed by trait theorists is not acceptable from a behavioral perspective. The lexical approach proposes to assess a large number of personality variables as descriptive characteristics of a person. These authors measure the characteristics of people through self-reports, grouping the traits of people into five major factors or personality dimensions. The procedure then culminates in the so-called "big five" universal factors. The theorists of the behavioral psychology do not assume this methodology since they consider that the observed behavior is a *person – context* interaction. They also consider that a self-report about the own behavior is not appropriate to assess the objective behavior. For this reason, they propose to design contexts, tasks or tests assessing objectively personality variables such as thoroughness, planning, persistence, collaboration or risk

situations) and in terms of the type of learning through which the individual has incorporated their experience and their specific behavioral tendencies (extinction, demored reinforcement).

4.1.1. Organizing personality by type of context.

If we organize the personality in the same way as the large dimensions of the feature, depending on a set of contexts (collaboration, risk, persistence, etc.) we could classify them in static and dynamic contexts. In dynamic contexts, time is a very relevant variable. We can also classify the contexts into simple or complex depending on the number of stimuli, their characteristics and the possible relationships between them.

In the static contexts, the items of the tests do not modify the configuration of the stimuli during the task nor is there a bounded time interval to respond. On the other hand, in dynamic contexts, time is crucial to respond because stimuli are present for a limited time or because they change their characteristics of position, shape or colour along the trial. Both static and dynamic contexts present simple stimuli characterized by their morphology with different functions: Signal stimuli (discriminative), Noise stimuli (non-discriminative), Stimuli consequent with the response (aversive or attractive). In addition, both simple and complex contexts can allow performing one of the possible responses in each item or allow completing two or more response options. In the mentioned contexts there are no other individuals performing the same activity as the subject examined. The so-called complex contexts are always of a dynamic nature in which there may be virtual agents acting in the same context as the examinee. For the purposes of assessment, the performance of another person in the same task, may involve a bias in the natural tendency of individual's behavior with respect to the personality variable that we try to measure. The individual examined could imitate, compete or collaborate in the accomplishment of the task.

Assessing personality in a specific task, including more than one individual in it, is a threat to the internal validity of the test since, by definition, the behavior of the other person would be uncontrollable. It is not the case of the virtual

agents in complex contexts because they act according to the contingencies that the researcher has previously programmed. In short, virtual subjects must be configured as one element more of the main task to preserve validity of measurement.

In most of the tests developed to assess skills and personality, researchers designed simple and static virtual contexts, in which each individual performed the task in a computer. Examples of these are the test to assess risk assumed by the Lejuez group (The Balloon Analogue Risk Task, BART, [Lejuez et al. 2002](#). See Figure 7) or those developed by the PsiD-UAM Group (The Dice Test, [Arend et al. 2003](#); The Rullette Test, [Rubio et al., 2010](#)), The Cross-Street Test, [Santacreu et al., 2006](#)). Another similar test to assess stress resistance is the BAcQ ([Kubinger, 2009](#)). Psychologists have developed static complex tests to measure cooperation in a context in which there is another virtual agent that performs its own task. The evaluated person can see the virtual agent and can try to collaborate with him. The Puzzle test, ([Botella et al., 2011](#)), is carried out with another virtual mate and the Investment test ([Santacreu, 2004](#)) is carried out with five virtual mates.

4.2. Organizing personality by types of learning.

Our second proposal is to organize the structure of the personality according to the different types of learning and the corresponding processes of acquisition and extinction of each of them. The different types of learning, previously mentioned, could help to define the personality structure considering that the most elementary learning is the most impactful throughout the life history of the individual, influencing later learning and, therefore, shaping the personality of the individuals.

From this perspective, the most basic personality variable would be related to a type of basic perceptual learning as Habituation-Sensitization process. Habituate means responding by increasing the latency and reducing the intensity of the response to initially novel stimuli. On the contrary, sensitization consists in reducing latency and increasing the intensity of the response, to stimuli initially considered irrelevant. This increase in response may persist throughout numerous presentations of the same stimulus.

habituate or sensitize to irrelevant stimuli. If our proposal were successful, we could classify individuals by the ease with which they habituate or sensitize to irrelevant stimuli and this would affect other more complex associative learning processes.

In the same way, we propose to organize the personality around the associative learning: classic and operant conditioning. We study personality in these learning contexts by their similarity to real-life situations. For example, researchers have studied the variable persistence in operating contexts with multiple responses. In the acquisition phase one of them (R₂) was the reinforced response while in the extinction phase none of the possible responses (R₁, R₂, R₃ ...) were reinforced. Persistent and obstinate people in the phase of extinction, repeat insistently the behaviors (R₂) that were previously reinforced in the acquisition phase. The measure of persistence obduracy is the number of responses (R₂) reinforced in the acquisition phase that performed in the extinction phase, to complete the task. A large number of variants of conditioning processes that resemble real situations that psychologists consider interesting to study as personality variables. Psychologists consider that persistence is a dimension of personality in one end of which is obstinacy and in the other perseverance. The persistence in the end of perseverance is to search for and try new answers that achieve the expected consequence. They consider that the proportion of new responses, other than those previously reinforced in the acquisition phase, is a good measure of perseverance.

Some authors ([Kahneman and Tversky 1979](#), [Schmeidler 1989](#)) propose to study personality in an operating context as a decision-making task in which the individual chooses between different options. In these tasks or tests, each option is defined by the probability or temporal interval between responses and consequences and, later, by the pleasant or aversive characteristics of the elements present in the context. Therefore, we could classify the pleasant contexts in those in which individuals choose between different options that differ in the delay with which each individual obtains the consequence and those, in which the options differ in probability with each individual gets the

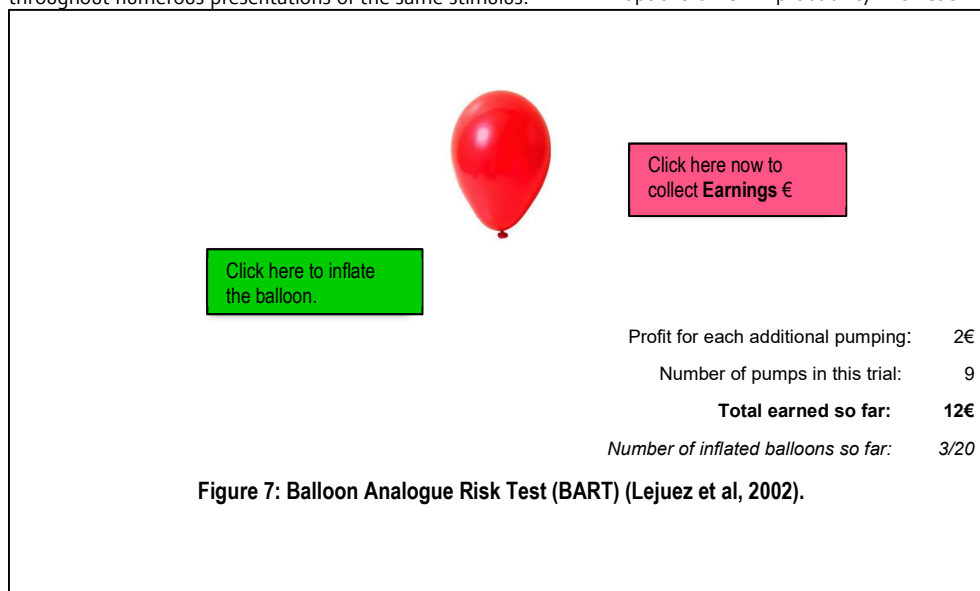


Figure 7: Balloon Analogue Risk Test (BART) ([Lejuez et al, 2002](#)).

This learning process could be the most elementary and transversal personality variable of the person that affects all the others. This description recalls concepts such as sensitivity to stress or impulsivity frequently used in psychological literature. If our proposal were correct, we could classify individuals by the ease with which they

consequence. An example of the first type would be a context that presents options with pleasant consequences of small magnitude in the short term in the face of consequences of greater magnitude but in the long term. An example of the second type would be a context that presents options with pleasant consequences of small

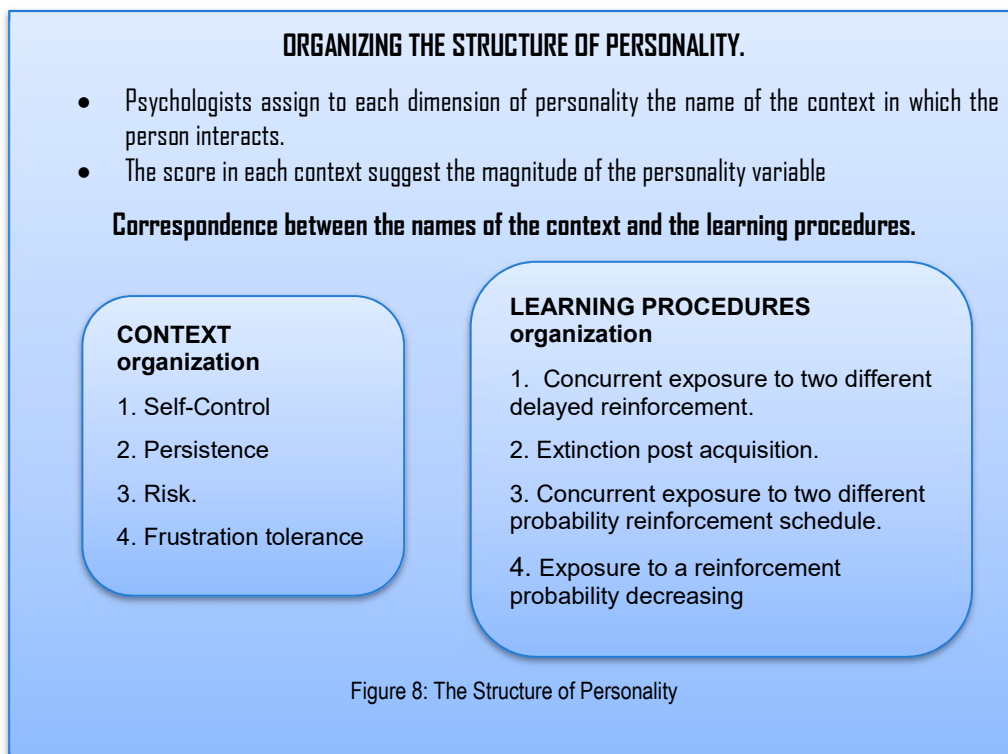
magnitude with high probability against consequences of greater magnitude with less probability. Researchers call self-control contexts to the first case and risk contexts to the second.

The study of personality in operant contexts has proposed other possibilities. To study tolerance to frustration in operant learning contexts, researchers have configured the task in a way that progressively decreases the response-consequence contingency relationship. They are situations in which progressively increases the difficulty to reach the desired criterion or consequence. In these situations, the rate of reinforcement is decreasing and, in some individuals, the response rate decreases while in others it increases. In short, the frustration increases because the task can not be solved with a different effect among the participants: some of them increase their activity level (they increase the response rate) and others reduce it and abandon the task (they reduce the response rate). Researchers considered that individuals, who decrease the response rate or the proportion of correct answers in these contexts, do not tolerate the frustration induced by the reduction of the desired consequences.

Human resources psychologists have studied trust and collaboration as personality variables that predict job performance. These personality variables can be studied in complex operating contexts, in which virtual individuals in addition to the assess person carry out the task. However,

verbal instructions of others, both in simple or complex contexts). Structure the personality according to the type of learning is a promising possibility. The underlying assumption is that the most elementary learning is involved in higher order learning. This means that what individuals learned through the most elementary learning determines how to behave in complex situations in which different types of learning are involved. According to this approach, the structure of the personality is parallel to the complexity of the types of learning and of the contexts in which it is learned.

Research strategies in the field of personality will try to prove that individual differences will be more general, the more primitive and elementary is the type of learning and the context in which the individual learns. From our point of view the most important thing would be to obtain, various objective measures of the personality involved in simple learning that permeate the behavior of the individual in a general way. Our proposal is to build on firm foundations a theory of personality using objective measures to validate it. Our immediate goal is to match the predictive capacity of general skills in people's performance. To do this we have to imitate the procedures for measuring aptitudes and achieve their characteristics in an orderly manner: simplicity, objectivity, precision, internal consistency and reliability (see Figure 8).



the social contexts in which diverse individuals act that can observe the behavior of the classmates suppose a higher level of potential learning. In these contexts, all the participants work on a task and achieve their own positive or negative consequences, but if they observe the behavior of the other participants and collaborate, each one of them can obtain greater gains with less effort. If in these complex observational social contexts the possibility of verbal communication among the participants is included, the level of complexity of the situation increases appreciably. We believe that it is possible to design tests that could potentially measure the personality objectively taking into account the set of different types of learning (perceptive non-associative, associative, by observation of others, by

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