Human AI

Assessment of personality and soft skills with AI

Human AI

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WHO WE ARE

Human AI was born as a research, development and co-design project between the educational, business and university sectors. Today it is a company that combines science and technology to create innovative solutions that improve human well-being and development. Our team is made up of experts in artificial intelligence, psychology, neuroscience, education and health, who work together to design products and services that respond to the real needs of people and society.

Our vision is to create a more human world, where technology is a tool to enhance people's capabilities and values. Therefore, we apply ethical and quality principles in all our projects, seeking a balance between social and economic benefit. At HumanAI, we believe that artificial intelligence can be an ally to positively transform the world. And "help those who help."

 Learn more about us here.

> **Our vision is to create a more human world, where technology is a tool to enhance people's capabilities and values.**

Human AI

WHAT WE DO

Our NLP and ML algorithms analyze personality based on the Big 5/OCEAN model of personality (McRae & John 1992), which is the most scientifically accepted model. **With a text of only 1,000 words, you can learn about 35 parameters of personality and socio-emotional skills without a test** (SES, based on the OECD model), comparing them with a large global database and accompanying the results with guidelines and recommendations.

A simple, immediate and reliable method, thanks to advances in psycholinguistics and artificial intelligence, which avoids self-perception bias, social desirability and other biases associated with self-assessment tests. The service is offered through a web app that allows working with individual and collective data and with an API, for entities with their own platforms. Users (B2B) agree to comply with the code of digital ethical conduct implied by our use conditions, consistent with our responsible AI policy and our adherence to the Montreal Declaration for the ethical development of AI.

II.
Application areas

Currently, there is evidence in a growing body of empirical research on the importance of personality characteristics in areas of society with a life impact (Gutman and Schoon, 2013; Heckman and Kautz, 2012; Kautz et al, 2014; Roberts et al. ., 2007).

In particular, these studies suggest that **various personality attributes have a substantial influence on education, achievement, employment status, productivity, job and life satisfaction, and health, among other areas.**

A concept closely related to personality that should be introduced is that of soft skills, considered as the skills or competencies of the 21st century (Murnane and Levy, 1996), which are associated with personality traits (Kyllonien 2012). They are non-cognitive skills (for example, perseverance, self-control, or growth mindset) that facilitate efforts toward goal achievement, healthy social relationships, and appropriate decision making, and predict academic, economic, social, and psychological performance. and people's physical well-being (Duckworth and Yeager, 2015).

EDUCATION
throughout life

In the educational field, personality assessments allow us to detect early signs that can influence academic performance and professional future. Furthermore, in Secondary Education and Higher Training they provide key information to guide the development of skills for future employment opportunities.

The OECD begins to evaluate SES internationally: education, employability and well-being.

> **SES are a key factor in academic, professional and life performance and, most importantly, they are malleable (Chernyshenko et al., 2018)**

OECD structure of socio-emotional competencies adapted from the Big Five
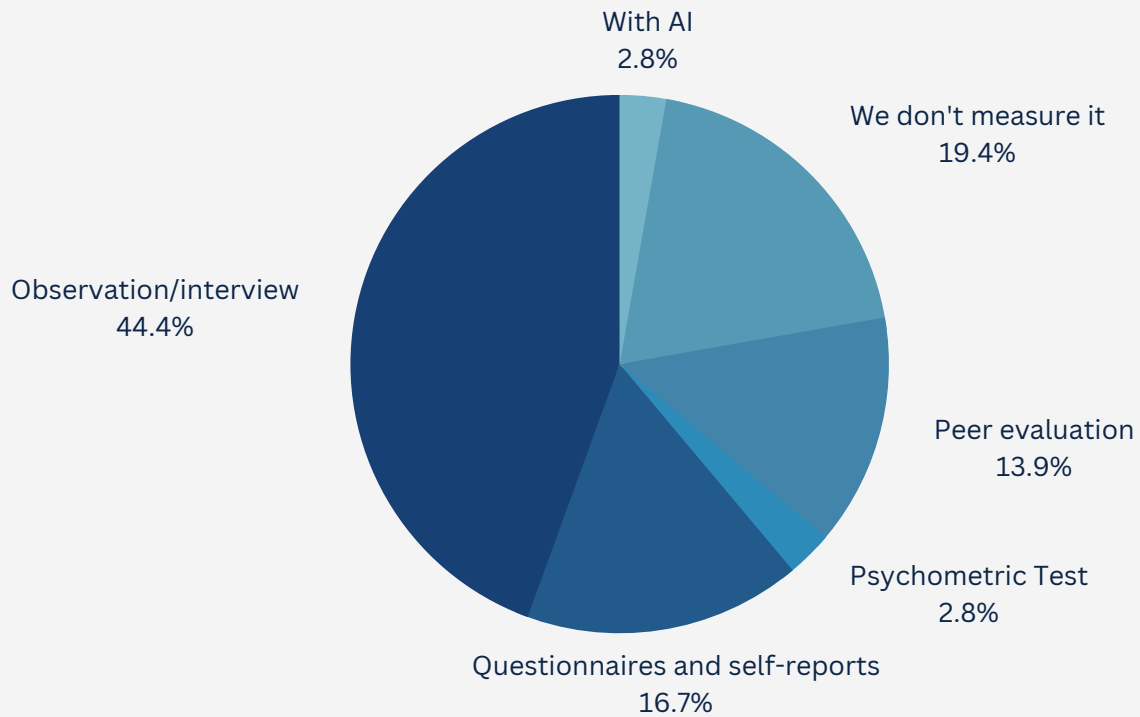

SOURCE: OECD (2023)

To avoid bias, carry out continuous evaluation and act individually and collectively, HumanAI collaborates with Primary, Secondary, Vocational Training and Continuing Training educational centers, providing assessments based on the OECD model.

**Are SES currently measured in
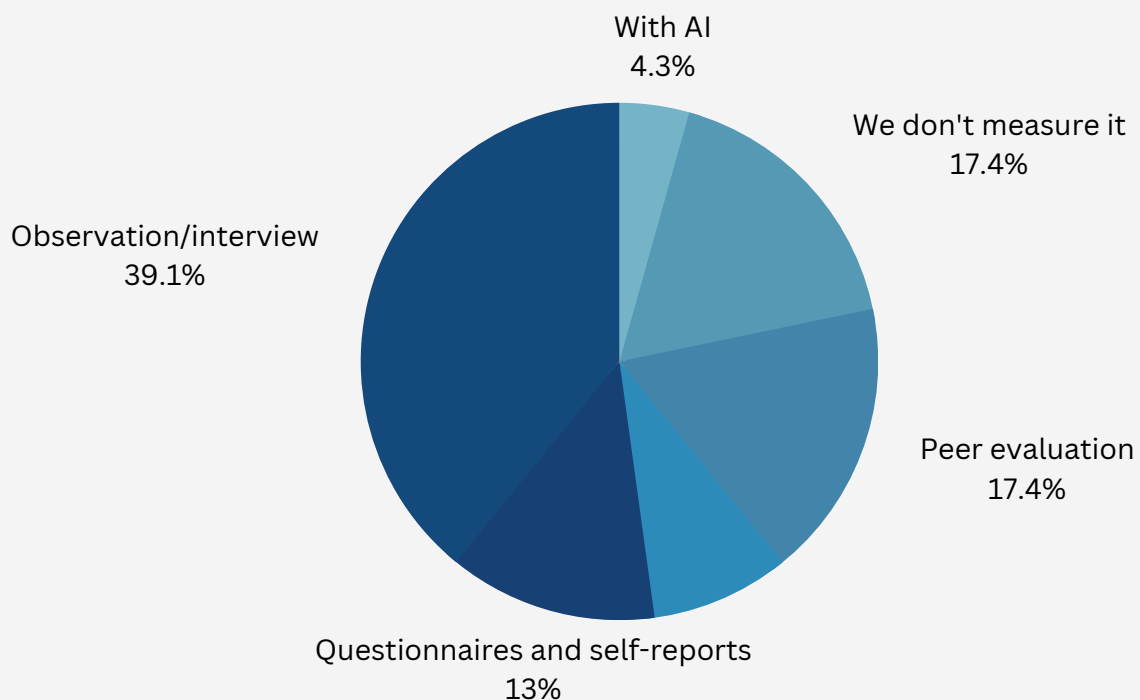teachers and students?**

We have them in mind

participation

attention

we don´t measure them

important

viewpoints

results

we value it

empathy

no so far

frustration

sometimes

we don´t measure them

joy

empathy

no so far

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How do you measure teachers' SES?

With AI
2.8%

We don't measure it
19.4%

Observation/interview
44.4%

Peer evaluation
13.9%

Psychometric Test
2.8%

Questionnaires and self-reports
16.7%

How do you measure students' SES?

With AI
4.3%

We don't measure it
17.4%

Observation/interview
39.1%

Peer evaluation
17.4%

Questionnaires and self-reports
13%

Employment and HR

In the workplace, specifically in the area of human resources, the benefits of these types of assessments offer information about how candidates' personalities will affect their behavior in the workplace, allowing recruiters and company managers to understand how candidates They interact, solve problems and manage their emotions.

Recruiters can filter candidates from a pool for a specific job position, based on underlying personality traits. For example, if you are looking to hire a business analyst, you will look for personality traits such as critical thinking, assertive communication, problem solving, conflict management, negotiation skills, or multilingual skills. Indeed, with personality assessment, current traits and the potential for future behavior can be determined, being much more complete than the measurement of specific competencies.
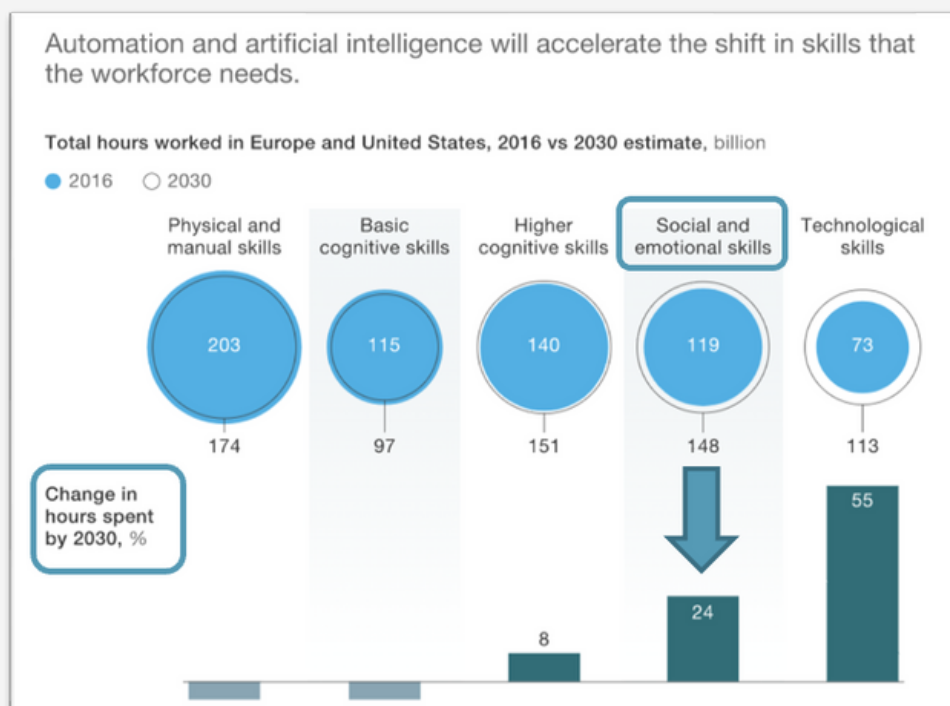

Source: Future of work, McKinsey

Entrepreneurship

In the world of entrepreneurship, technical skills are important, but social-emotional skills (SES) play a vital role in achieving success.

Scientific evidence has shown that open-mindedness (Obschonka et al., 2019; Wu et al., 2019; Zhao et al., 2010), intellectual curiosity (Zhao et al., 2010), cooperation (Li et al., 2009; Liu and White, 2001), boldness (Dilli et al., 2020; Park et al., 2017), assertiveness (Liñán and Chen, 2009; Miao and Wang, 2019) or cordiality (Olokundun et al., 2018) are some of the most relevant SES for an entrepreneurial profile.

The HumanAI entrepreneurship report has been prepared based on two elements: on the one hand, a review of scientific evidence has been carried out that evaluates the impact of SES on the entrepreneurial personality. And, on the other hand, the assessment of the competencies has been collected, through a Delphi and a survey with 40 experts with extensive experience in the world of entrepreneurship (entrepreneurs, businessmen, advisors, investors and academics). In this survey, they have classified the competencies in order of importance (on the scale: critical, relevant or necessary) for a person to develop an entrepreneurial profile.

Based on both sources, scientific evidence and experts, groupings of competencies have been established in order of importance.

Human AI
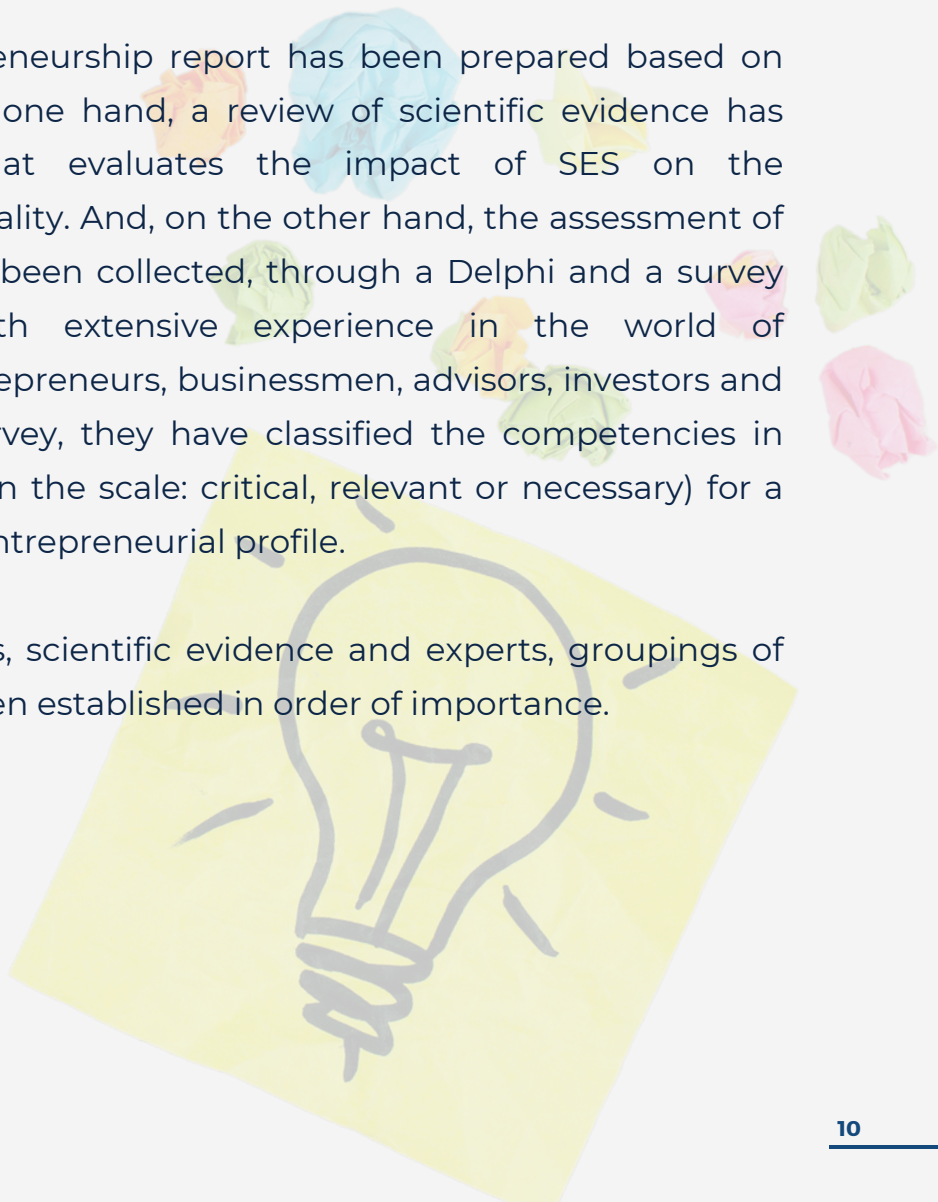
Sports

Successful athletes have certain psychological characteristics that help them achieve the desired results, indicating, among others, the ability to overcome anxiety and obstacles that arise, self-confidence, competitiveness, intrinsic motivation, the ability to avoid distractions or the ability to set goals and achieve them (Allen et al., 2011; Gould et al., 2002).

Those who have high levels of self-confidence have more chances of success than those athletes who are attributed low levels of confidence.

(From Francesco & Burke, 1997; Gould et al., 2002; Pickens et al., 1996

Human AI

AI vs traditional tools

Traditional personality and competency assessment tools are too complex and slow for everyday use.

Long, tedious and difficult to understand questionnaires.

Self-perception and social desirability biases of the tests.

Limited professional resources to manage, interpret and report results.

High cost of time invested by the qualified professional.

Limited and inflexible analysis of groups, normative references and comparative statistics.

Human AI
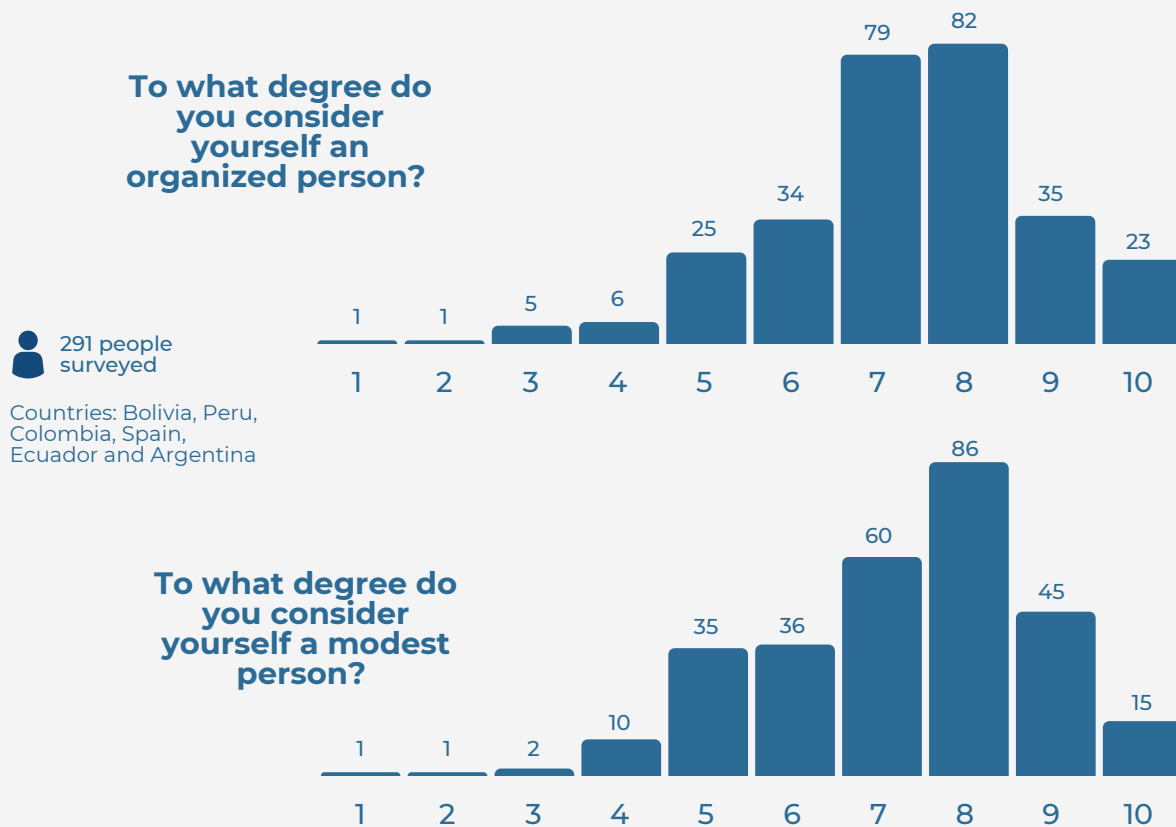
AI vs traditional tools

The objective of the AI evaluation model is to resolve the limitations of psychometric tests to evaluate personality and socio-emotional competencies by optimizing the evaluation, processing and reporting time, so that you obtain the analysis in a few minutes.

☑ Application of psycholinguistics to new, immediate and easy-to-use evaluation methodologies.

☑ It helps human development professionals (educators, counselors, psychologists, and human resources managers) by offering them personalized intervention recommendations, based on objective and reliable evaluations.

☑ It is based on the most current empirical knowledge and validated in the field and scientifically.

☑ The procedure is more dynamic and agile for the user, since through a user's text our solution uses natural language processing (NLP) of the individual (spoken or written), extracting the linguistic, semantic and contextual characteristics that allow us to infer the traits of his personality.

☑ Provides evaluation and statistical results and reports automatically.

☑ Available in Spanish and English.

☑ Avoid self-perception bias.

Human AI

Field validation studies on self-perception bias

At Human AI, we have proven it: if you ask a sample of hundreds of people from different countries to evaluate how organized and modest they are, the majority will respond in a positively biased way, with a high score.

To what degree do you consider yourself an organized person?

291 people surveyed

Countries: Bolivia, Peru, Colombia, Spain, Ecuador and Argentina

1	2	3	4	5	6	7	8	9	10
1	1	5	6	25	34	79	82	35	23

To what degree do you consider yourself a modest person?

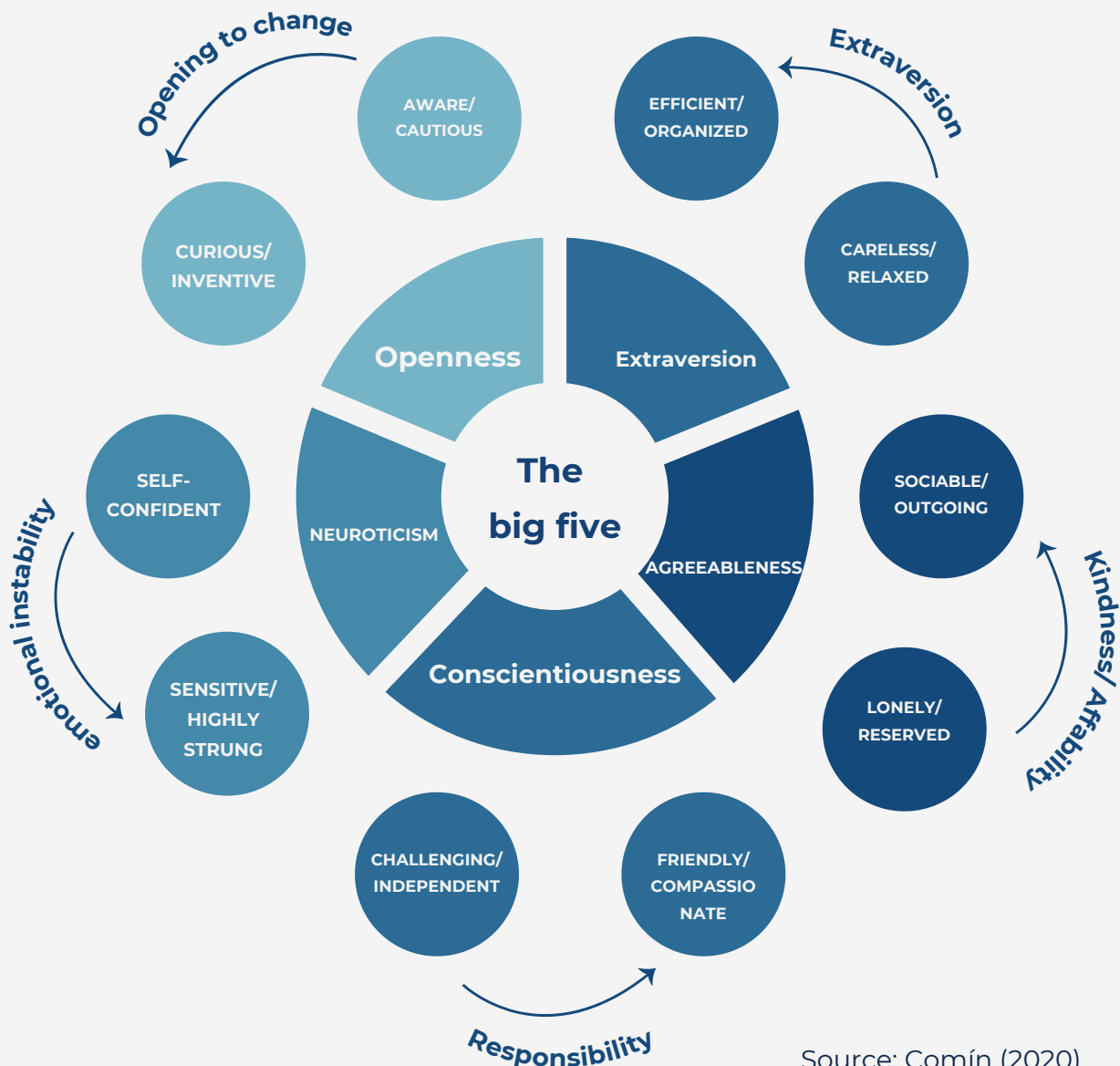| 1	2	3	4	5	6	7	8	9	10
1	1	2	10	35	36	60	86	45	15

In the perception that human beings have of themselves and their behavior, they systematically tend to make interpretations that allow them to maintain a positive vision of the self, which frequently leads to a biased interpretation of reality and self-deception in self-perception. This self-perception bias is reflected in personality tests in any self-assessment situation, where social desirability is a conditioning factor.

OCEAN model of personality

The name of the OCEAN model refers to the English acronym of the 5 factors of which it is made up (Openness, Responsibility, Extraversion, Agreeableness and Neuroticism).

The model arises from different parallel and independent investigations that concluded through factor analysis that the different personality traits can be statistically grouped into 5 large categories (McCrae & Costa, 2003).

Source: Comín (2020)

OCEAN compared to other models

	OCEAN	DISC	MBTI
Test measurement	30 (espectrum)	4 (quadrant)	4 (binary)
Results	∞	12 profiles	16 personalities
Reliability	**High** Considered one of the most reliable and consistent personality models in psychological research. It has been shown to have high reliability in both self-report and observational studies (Costa & McCrae, 1992).	**Questionable** Some studies have found that DISC results are not consistent over time or between different raters (Hartmann & Gehlert, 1994).	**Questionable** Some studies have found that MBTI results are not consistent over time or between different raters (Pittenger, 2005).
Validity	**High** Considered one of the most valid personality models. It has been shown to have high predictive validity in a wide variety of contexts, including the workplace, education, and mental health (Ozer & Benet-Martinez, 2006).	**Questionable** Some studies have found that it is unclear which dimensions of the DISC model correlate with dimensions of other personality models (Hartmann & Gehlert, 1994).	**Questionable** Some studies have found that it is not clear which dimensions of the MBTI model correlate with dimensions of other personality models (Pittenger, 2005).
Prediction	**Wide** It has been used to predict a wide variety of outcomes, including job performance, academic success, and mental health (Roberts et al., 2007).	**Unclear** Although it has been used to predict job performance in some studies (e.g., Schmidt et al., 1986), the ability of the DISC model to predict outcomes in other contexts is unclear.	**Unclear** Although it has been used to predict job performance in some studies (e.g., Barrick & Mount, 1991), the ability of the MBTI model to predict outcomes in other contexts is unclear.

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- Ozer, D. J., & Benet-Martinez, V. (2006). Personality and the prediction of consequential outcomes. Annual Review of Psychology, 57, 401-421.
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Relationship between the study of language and the study of personality

Current models of personality trait theory consider the lexical hypothesis plausible, according to which the most salient and/or socially relevant individual differences will be encoded in language (John and Srivastava, 1999; McCrae and John, 1992).). In this way, language analysis would be a reliable source of information to describe the characteristics that can define and build human personality (Sánchez and Ledesma, 2007; Sanz et al., 1999).

**P
e
r
s
o
n
a
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y**

Pattern of behavior that characterizes us (way of thinking, feeling, reacting).

Differentiate one person from another.

Has a consistency/continuity across different circumstances or situations.

Describes the person: values, self-knowledge, self-efficacy.

It develops throughout a socialization process.

Artificial Intelligence

Our IA

Our Artificial Intelligence is based on the same technology on which the great language models that are so successful in all fields related to NLP are based.

These models are capable of processing natural language in its context, that is, taking into account the grammatical structure and semantic relationships of the words in a text, even if it involves information that is separated by several sentences or paragraphs.

They are huge models, pre-trained on large data sets containing millions of texts and capturing information in hundreds of thousands of parameters, allowing complex language patterns and characteristics to be inferred in a wide variety of contexts.

Our models are fine-tuned using supervised learning techniques, where they are fed large amounts of data labeled according to the parameters that make up the personality traits of the OCEAN model and learn to infer the syntactic and semantic relationships between words, understanding the context in which they are used according to characteristic personality traits.
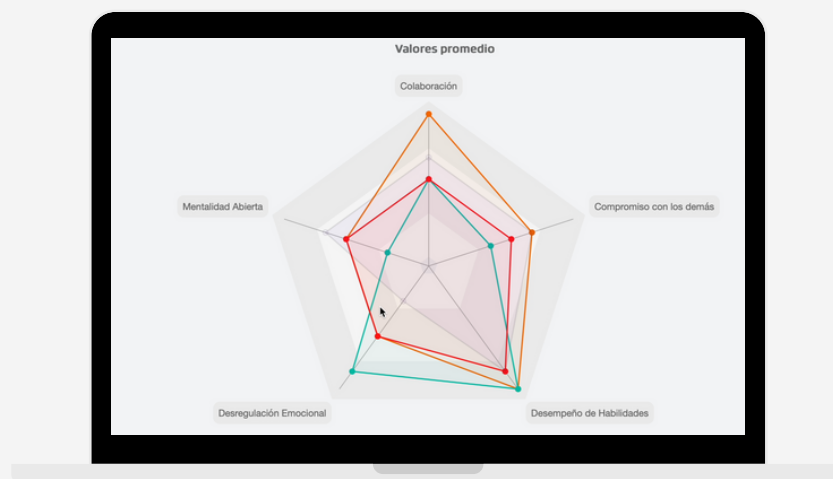
Artificial intelligence

How is it done?

The attention technique used in language models takes into account several linguistic aspects:

- **The relative frequency of words** and the frequency of words that appear together.
- **The distance between words,** which may be more or less important depending on the distance that separates them in the text.
- **The syntax of a sentence,** since the grammatical structure allows us to determine the relative importance of each word in the context.
- **Cohesion, the relationship between ideas in a text and how they relate to each other,** identifying the most relevant words in a given context.

These linguistic aspects occur differently in different personality traits and our AI uses them to differentiate a text labeled with a certain personality trait from another, learning how these linguistic aspects vary in the natural language of thousands of people with different traits. of personality.

To measure personality through language, linguistic parameters are applied, which are the characteristics that allow describing and analyzing the use of language in different contexts and situations (Mairesse et al., 2007, Pennebaker et al., 2003).

Most common linguistic parameters:

- **The type and function of the antecedent:** the antecedent is the word or phrase to which a relative refers, such as where, what, or who. The type of the antecedent can be nominal, verbal, prepositional or adverbial, and its function can be subject, object, complement or modifier.
- **The value of the relative:** the relative is the word that introduces a subordinate clause that modifies the antecedent. The value of the relative can be locative, temporal, causal, final or modal, depending on the meaning it contributes to the sentence.
- **The type and category of the verb:** the verb is the word that expresses the action, state or process of a subject. The type of the verb can be transitive, intransitive, copulative or auxiliary, and its category can be regular, irregular, pronominal or impersonal, depending on its form and function.
- **The presence or absence of a preposition:** the preposition is the word that introduces a complement that modifies the verb or noun. The presence or absence of a preposition can affect the meaning or grammaticality of a sentence.
- **The type of relative construction:** the relative construction is the structure formed by the antecedent and the subordinate clause introduced by the relative. The type of relative construction can be specifying, explanatory or free, depending on whether it restricts, clarifies or expands the meaning of the antecedent.

An explainable method

We carry out studies that are yielding promising results in which, using linguistic computing tools, especially salient linguistic pieces are extracted in one corpus (focus corpus) in comparison to another (reference corpus), based on the comparison of the normalized frequencies of all the linguistic elements that make up the two corpora. Those that register a greater mismatch in their frequency in the two corpora obtain a higher result (score), which means assigning them a greater degree of salience in one corpus compared to the other; In other words, these will be linguistic-discursive features that are especially characteristic of the focus corpus compared to the reference corpus.

A first group of *corpus* has been created from the texts available in the first phase of research to identify which linguistic features are operating as decisive clues so that the developed tools are assigning certain personality traits to each text. In this way, the linguistic validation of the tool is being carried out.

| Corpus Group	N° Words
HIGH opening	369.117
LOW Opening	312.595
HIGH Neuroticism	721.671
LOW Neuroticism	236.288
Extraversion HIGH	307.444
Extraversion LOW	294.342
HIGH Responsibility	381.250
LOW Liability	703.858
Kindness HIGH	632.645
Kindness LOW	141.687

A precise method

In different studies carried out with hundreds of people, Human AI is comparing the results of the evaluations with its AI tool with the evaluations of external observers.

1235

students from 13 schools and VET centers have benefited from analysis with our prototypes in 2021.
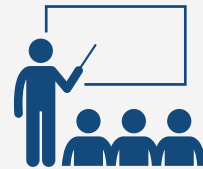
85%

of the 340 teachers rated it as accurate or very accurate.

1265

professionals (HR, psychology and psychiatry) from more than 10 countries have tested the prototypes, increasing their self-knowledge and considered the report very accurate.

60

Counselors from Public Employment Services have piloted the prototypes, giving feedback on their ease of use.

A consistent method

We carry out studies focused on ensuring the capacity of these language models to identify the personality traits present in a population, according to the patterns previously studied around the OCEAN model (Big5).

Our AI allows us to infer the relationships between the personality traits of a population according to these patterns, identifying the relationships between the different personality traits in the population in a satisfactory way.

Our validation results show how the model identifies relationships between personality traits, being able to generate correlations between them in accordance with previous studies carried out with the OCEAN model and other evaluation alternatives (McCrae and Costa, 1992).

Example of correlation between the 35 facets of the OCEAN Model evaluated with our tool
Study carried out in 2022
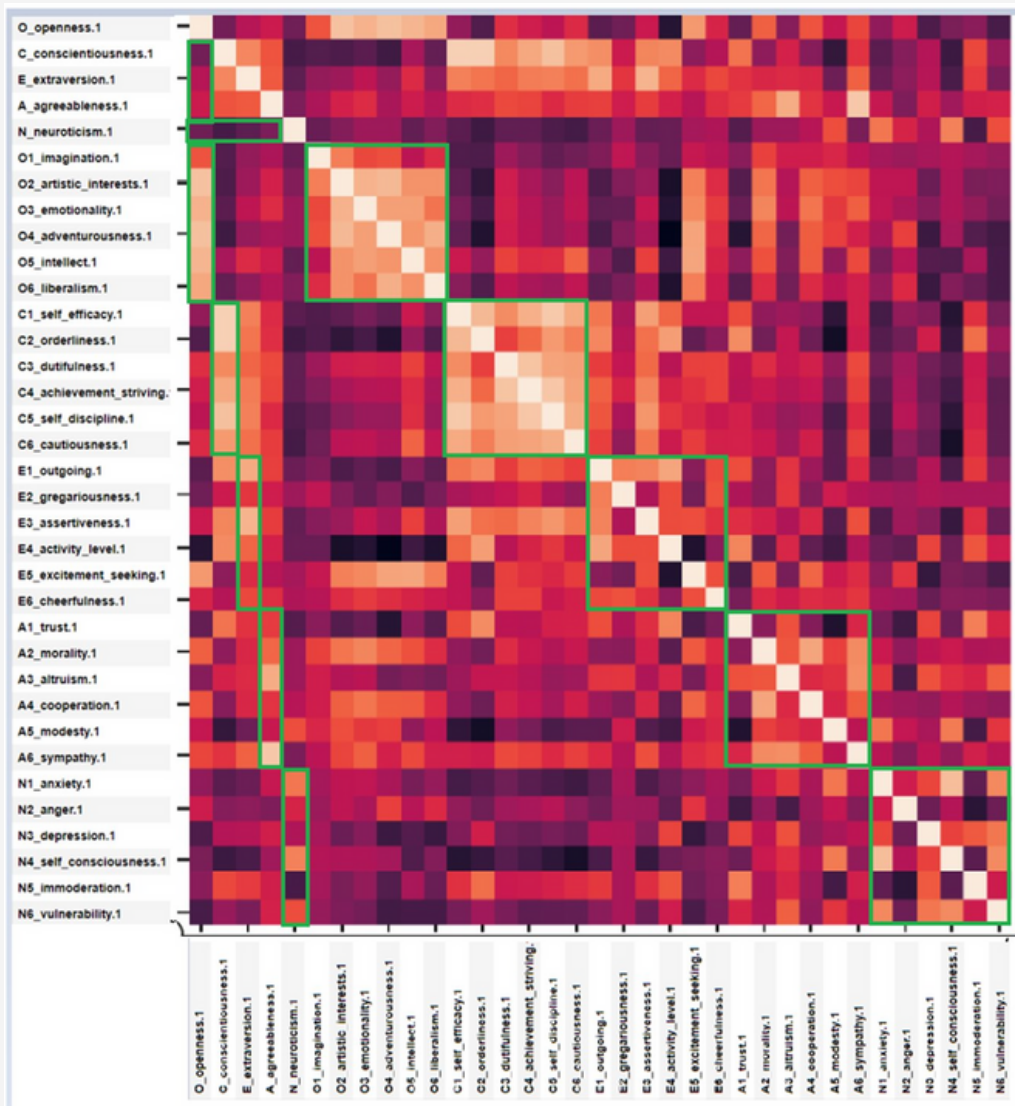
Fuente: Human AI

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