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# Comparison of Neutrosophic Operators of Personality in Lawyers of the City of Santo Domingo

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**Abstract.** The objective of this study was focused on demonstrate the usefulness of using neutrosophic logic to determine and compare different personality traits in a sample of lawyers from the city of Santo Domingo. For this, a sample of 10 lawyers was taken, 5 of them specialized in the field of criminal defense, and 5 specialized in family defense. The neutrosophic correlation was used to select the most important personality traits to be analyzed during the study. The results obtained allowed focusing the analysis on 3 pairs of traits-anti-traits on which the sample was analyzed. The study made it possible to determine that the sampled criminal lawyers turned out to be more extroverted and less sensitive than the family lawyers. The latter presented a lower average level of insensitivity than the criminal lawyers and less rigidity. On the other hand, criminal lawyers showed indeterminacy between sensitivity and insensitivity.

**Keywords:** neutrosophic psychology, personality traits, jurists, lawyers, neutrosophic correlation coefficient.

## 1 Introduction

The need to consider solutions to the various scenarios that arise in daily life becomes increasingly vital in the face of the continuous presence of uncertainty in the data that is handled. In this way, analysts and decision-makers find it necessary to broaden their range of tools more and more in order to achieve results suitable for real life [1].

Neutrosophy is a branch of philosophy initiated by Smarandache, in 1995, as an extension of dialectics [2]. This theory studies the origin, nature, and scope of neutralities, as well as their interactions with different ideational spectra [3].

Neutrosophic set theory constitutes a powerful element that allows transcending the concept of an intuitionistic fuzzy set [4]. The origin of neutrosophy has conceived a dynamic triad: (<A>, <neutA>, <antiA>). <A> is an entity (concept, idea, theory, etc.) while <antiA> is its opposite. In this sense, the inclusion of the third element, <neutA>, is conceived as the neutral between the opposites <A> and <antiA>. Including the aspect of indeterminacy that does not opt for any of the poles of the concept or idea analyzed [5].

The use of neutrosophic logic in various aspects of life can solve certain problems that cannot be solved, effectively and adequately, by other means. This theory deals with imprecise and vague situations where exact analysis is difficult or impossible [6].

Neutrosophy has evidenced the expansion of neutrosophic logic toward the creation of neutrosophic sets, neutrosophic probability analysis, neutrosophic statistics, and many others. This evolution has allowed an increasing scope in various fields of science. Hundreds of applications have been seen in the fields of engineering and computing, decision support, image processing, facial recognition systems, medical diagnostics, administration, industry, and many other fields where indeterminacy is present [7], [8].

Likewise, the field of study of the human psyche, or psychology, has seen the birth of applications of great interest associated with neutrosophic logic. Human behavior is extremely complex and is the result of many simultaneous interactions between pluri-underegos, pluriegos, and pluri-superegos. No individual fits completely (100%) to a trait; this can happen only in an idealistic way [9].

Neutropsyche is a new psychological theory that studies the soul or spirit using the theories of neutrosophy and neutrosophic logic. This theory is based on neutrosophic psychological concepts, operations, ideas, and assumptions with the form (<A>, <neutA>, <antiA>) (positive, neutral, negative), (insufficient thinking, normal thinking, -thinking), etc. ., and its refinements [10].

Neutropsychic personality traits constitute a dynamic psychological system open to tendencies to feel, think

and act in a very specific way in each individual. In this way, it can be established that the neutrosophic psychological theory studies the concepts of traditional psychology, from a triad of possible states (<A> <neutA> <antiA>) [11].

Specialists in the field of legal sciences are probably some of the professionals who are greatly influenced by the situations they must face every day in the exercise of their work. From the constant process of making ethical decisions to coping with personal and social dogmas, they are elements that shape and in turn forge the character and personality of most of them.

The objective of this study focuses on demonstrating the usefulness of using neutrosophic logic to determine and compare different personality traits in lawyers in the city of Santo Domingo. For this, the study is carried out on a sample of 10 lawyers from different fields of specialization, through the use of experts, and a comparison and analysis of the results are carried out.

As a complementary method for decision-making, correlation coefficients are used, also using neutrosophic logic, in a way that is consistent with the objective of this study. These coefficients are a tool of great importance in judging the relationship between two objects, and as a method, it has been applied before, as an effective way for data analysis and classification, in the decision-making process, etc. [12].

In the present study, some basic concepts related to the Theory of Neutrosophic Psychology are firstly analyzed. Subsequently, the use of correlation coefficients using single-value neutrosophic numbers (SVNN) based on the extension of the correlation coefficient of intuitionistic fuzzy sets is analyzed. Consecutively, the bases on which the analysis is carried out are established, the results achieved are presented, and, the conclusions derived from the study are enunciated.

## 2 Prelims

### 2.1 Preliminary Neutrosophic Psychological Theory

The triplet $(< A >, < neut\,A >, < antiA >)$ is extended to discrete refined neutrosophic memory, where $(< A > 1, < A > 2, \dots, < A > l; < neutA > 1, < neutA > 2, \dots, < neutA > m; < antiA > 1, < antiA > 2, \dots, < antiA > n)$ are defined based on refined neutrosophy.

Given a universe of discourse, subsets A, B, and C, then the crisp neutrosophic set satisfies the axioms: $A \cap B = \emptyset, B \cap C = \emptyset, C \cap A = \emptyset,$ and $A \cup B \cup C = U$. Therefore, A, B, and C form a disjoint partition of the universe of discourse U.

The refined neutrosophic crisp set for type 2 (and similarly for types 1 and 3) is defined as: $A = A1 \cup A2 \cup \dots \cup Ap$, $B = B1 \cup B2 \cup \dots \cup Br$, $C = C1 \cup C2 \cup \dots \cup Cs$, with $A \cap B = B \cap C = C \cap A = \emptyset$, where p, r, s are integers $\geq 1$, $p + r + s \geq 4$, and $Ai \cap Aj = \emptyset$ for $i, j \in \{1,2, \dots, p\}$, $i \neq j$; $Bk \cap Bl = \emptyset$ for $k, l \in \{1,2, \dots, r\}$, $k \neq l$; and $Cm \cap Cn = \emptyset$ for $m, n \in \{1,2, \dots, s\}, m \neq n$ [9].

Various experts and trait theorists have concluded that the position of the human being moves on the spectrum between two opposite traits, that is, he behaves dynamically. As an easy generalization of all trait models, any number n ≥ 1 of Traits (traits) and their corresponding antiTraits can be considered, for $1 \leq j \leq n$:

$< A\,1 > / < antiA1 >, < A\,2 > / < antiA2 >, \dots, < A\,n > / < antiAn >$.

If the degree of the Trait is greater than or equal to the Trait Threshold (ThT), then the individual is characterized by this Trait. Similarly, if the degree of antiTrait is less than or equal to the threshold of antiTrait (antiThr), then he is characterized by antiTrait. In a neighborhood of the midpoint [-ε, ε], it is the most confused (indeterminate) degree (almost half Trait and half antiTrait) or combination of Trait-antiTrait [13], [23], [25].

Personality traits are measurable by calculating the degree of <A> and the degree of <antiA>. Really, in the world, no individual fits completely (100%) to a personality trait since this is only possible idealistically. In this way, the constants: -antiThr, +Thr, and ε depend on each antiTrait/Trait pair, so they can be different from one antiTrait/Trait pair to another. These constants are generally determined by experts in psychology, depending on the research interests [14], [24], [26], [27], [28], [29].

In this sense, let any Trait/anti-Trait pair be, and let x be an individual belonging to a group of people S, then it is defined that:

$dTrait: S \rightarrow [0, 1]$,

*dTrait*(x) = the degree of the Trait that characterizes the individual x, and

$dantiTrait: S \rightarrow [-1, 0]$,

*dantiTrait*(x) = the degree of the antiTrait that characterizes the individual x. The Neutrosophic Trait Operator, combining the opposites, is the cumulative degree of individual x with respect to both the Trait and the anti-Trait, and is defined as:

$dRTrait\ and\ antiTrait: S \rightarrow [-1, 1]$,

$dTrait\ \&\ antiTrait(x) = dTrait\ (x) + dantiTrait(x)$.

For each Trait - antiTrait pair, the degree of the Trait dTrait(x) that characterizes the individual x, and the degree of the antiTrait dantiTrait(x) is calculated. Subsequently, the Neutrosophic Trait Operator dTrait & antiTrait(x) is used and compared with the two thresholds, Thr and antiThr:

- If $dTrait\ \&\ antiTrait(x) \geq +Thr$, then the individual is categorized as definitely belonging to the Trait,
- If $Trait\ \&\ antiTrait(x) \leq -antiThr$ , then the individual is categorized as definitely belonging to the antiTrait.
- If $dTrait\ and\ anti\ Trait\ (x) \in (\varepsilon, Thr)$, then the individual is classified as being in a totally indeterminate state between Trait and antiTrait.
- If $dTrait\ and\ anti\ Trait\ (x) \in (\varepsilon, Thr)$, then the individual is classified as belonging mainly to the Trait.
- And finally, if $dTrait\ \&\ antiTrait(x) \in (-antiThr, -\varepsilon)$, then the individual is categorized as mostly belonging to the antiTrait.

### 2.2 Correlation Coefficient of SVNSs

**Definition 1.** [15] Let X be a space of points (objects), with a generic element in X denoted by x. A neutrosophic set A in X is characterized by a membership function of truth $T_A(x)$, a membership function of indeterminacy $I_A(x)$, and a membership function of falsehood $F_A(x)$. The functions $T_A(x)$, $I_A(x)$ and $F_A(x)$ are standard or nonstandard real subsets of $]0^-, 1^+[$, that is, $T_A\ (x)$: $X \rightarrow ]0^-, 1^+[$ , $I_A\ (x)$: $X \rightarrow ]0^-, 1^+[$ $and\ F_A\ (x)$: $X \rightarrow ]0^-, 1^+[$. There is no restriction on the sum of $T_A\ (x)$, $I_A\ (x)$ and $F_A\ (x)$, so $0^- \leq supT_A(x) + supI_A(x) + supF_A(x) \leq 3^+$.

Obviously, it is difficult to apply the neutrosophic set to practical problems. The definition of SVNS is presented below.

**Definition 2.** [16] Let X be a space of points (objects) with generic elements in X denoted by x. An SVNS A in X is characterized by a truth membership function $T_A(x)$, an indeterminacy membership function $I_A(x)$, and a falsehood membership function $F_A(x)$ for each point x in X, $T_A(x), I_A(x), F_A(x) \in [0,1]$. Therefore, an SVNS A can be expressed as

$$A = \{x, T_A(x), I_A(x), F_A(x) \mid x \in X\}$$

Then, the sum of $T_A\ (x)$, $I_A\ (x)$, $and\ F_A\ (x)$ satisfies the condition $0 \leq T_A(x) + I_A(x) + F_A(x) \leq 3$.

**Definition 3**. [16] The complement of an SVNS A is denoted by and is defined as $Ac$

$$Ac = \{x, F_A(x), 1 - I_A(x), T_A(x) \mid x \in X\}$$

**Definition 4.** An SVNS A is contained within another SVNS $B, A \subseteq B$ if and only if $T_A(x) \leq T_B(x), I_A(x) \geq I_B(x)$, and $F_A(x) \geq F_B(x)$, and for every x in X.

**Definition 5**. Two SVNSs A and B are equal, written as A = B, if and only if $A \subseteq B$ and $B \subseteq A$

**Definition 6**. For any two SVNSs A and B in the universe of discourse $X = \{x_1, x_2, \ldots, x_n\}$, the correlation coefficient between two SVNSs A and B is defined as follows:

$$M(A,B) = \frac{1}{3n}\sum_{i=1}^{n}[\phi_i(1-\Delta T_i) + \varphi_i(1-\Delta I_i) + \psi_i(1-\Delta F_i)] \quad (1)$$

where

$$\phi_i = \frac{3 - \Delta T_i - \Delta T_{max}}{3 - \Delta T_{min} - \Delta T_{max}},$$

$$\varphi_i = \frac{3 - \Delta I_i - \Delta I_{max}}{3 - \Delta I_{min} - \Delta I_{max}},$$

$$\psi_i = \frac{3 - \Delta F_i - \Delta F_{max}}{3 - \Delta F_{min} - \Delta F_{max}},$$

$$\Delta T_i = |T_A(x_i) - T_B(x_i)|\ ,$$

$$\Delta I_i = |I_A(x_i) - I_B(x_i)|,$$

$$\Delta T_i = |T_A(x_i) - T_B(x_i)|\ ,$$

$$\Delta T_{min} = min_i|T_A(x_i) - T_B(x_i)|\ ,$$

$\Delta I_{min} = min_i|I_A(x_i) - I_B(x_i)|$ ,

$\Delta F_{min} = min_i|F_A(x_i) - F_B(x_i)|$ ,

$\Delta T_{max} = max_i|T_A(x_i) - T_B(x_i)|$ ,

$\Delta I_{max} = max_i|I_A(x_i) - I_B(x_i)|$ ,

$\Delta F_{max} = max_i|F_A(x_i) - F_B(x_i)|$ ,

For all and i = 1, 2, . . ., n$xi \in X$

However, the differences of importance are considered in the elements of the universe. Therefore, the weight $x_i(i = 1,2,\dots,n)$ of the element must be taken into account. A weighted correlation coefficient between the SVNS is presented below.

**Definition 7.** Let $w_i$ be the weight of each element $x_i\ (i = 1,2,\dots,n), w_i \in [0,1]$, and $\sum_{i=1}^{n} w_i = 1$, then the following weighted correlation coefficient between SVNS A and B is expressed as:

$$M_w(A,B) = \frac{1}{3}\sum_{i=1}^{n} w_i[\phi_i(1-\Delta T_i) + \varphi_i(1-\Delta I_i) + \psi_i(1-\Delta F_i)] \quad (2)$$

**Decision-making method using the correlation coefficient of SVNSs**

In the multi-attribute decision problem with single-valued neutrosophic information, the characteristic of an alternative $A_i\ (i = 1,2,\dots,m)$ on an attribute $C_j\ (j = 1,2,\dots,n)$ is represented by the following SVNS:

$$A_i = \{C_j, T_{Ai}\ (C_j), I_{Ai}(C_j), F_{Ai}(C_j) | Cj \in C, j = 1,2,\dots,n\}$$

Where $T_{Ai}\ (C_j)$ , $I_{Ai}(C_j), F_{Ai}(C_j)) \in [0,1]$ and $0 \le T_{Ai}\ (C_j)$ , $I_{Ai}(C_j), F_{Ai}(C_j) \le 3$ , for $Cj \in C, j = 1,2,\dots,n,$ and $i = 1,2,\dots,m.$

For convenience, the values of the three functions $T_{Ai}\ (C_j), I_{Ai}(C_j), F_{Ai}(C_j)$ are denoted by a single-valued neutrosophic value (SVNV) $d_{ij} =< t_{ij}, i_{ij}, f_{ij} >\ (i = 1,2,\dots,m;\ j = 1,2,\dots,n)$, which is usually derived from the evaluation of an alternative Ai against a criterion $C_j$ by the expert or decision maker. Therefore, a single-valued neutrosophic decision matrix $D = (d_{ij})_{mxn}$. can be obtained.

In multi-attribute decision problems, the ideal point concept has been used to help identify the best alternative in the decision set. Although the ideal alternative does not exist in the real world, it does provide a useful theoretical construct against which to evaluate alternatives.

In the decision-making method, an ideal SVNV can be defined by $d_j^* =< t_j^*, i_j^*, f_j^* >=< 1,0,0 >\ (j = 1,2,\dots,n)$ in the ideal alternative $A^*$. Therefore, applying Equation (2), the weighted correlation coefficient between an alternative $A_i\ (i = 1,2,\dots,m)$ and the ideal alternative $A^*$ is given by:

$$M_w(A_i, A^*) = \frac{1}{3}\sum_{j=1}^{n} w_j\left[\phi_{ij}\left(1-\Delta t_{ij}\right) + \varphi_{ij}\left(1-\Delta i_{ij}\right) + \psi_{ij}\left(1-\Delta f_{ij}\right)\right] \quad (3)$$

where

$$\phi_{ij} = \frac{3 - \Delta t_{ij} - \Delta t_{i\,max}}{3 - \Delta t_{i\,min} - \Delta t_{i\,max}},$$

$$\varphi_i = \frac{3 - \Delta i_{ij} - \Delta i_{i\,max}}{3 - \Delta i_{i\,min} - \Delta i_{i\,max}},$$

$$\psi_i = \frac{3 - \Delta f_{ij} - \Delta f_{i\,max}}{3 - \Delta f_{i\,min} - \Delta f_{i\,max}},$$

$\Delta t_{ij} = \left|t_{ij} - t_j^*)\right|$ ,

$\Delta i_{ij} = \left|i_{ij} - i_j^*)\right|$ ,

$\Delta f_{ij} = \left|f_{ij} - f_j^*)\right|$ ,

$$\Delta t_{i\,min} = min_j \left| t_{ij} - t_j^* \right| ,$$

$$\Delta i_{i\,min} = min_j \left| i_{ij} - i_j^* \right| ,$$

$$\Delta f_{i\,min} = min_j \left| f_{ij} - f_j^* \right| ,$$

$$\Delta t_{i\,max} = max_j \left| t_{ij} - t_j^* \right| ,$$

$$\Delta i_{i\,max} = max_j \left| i_{ij} - i_j^* \right| ,$$

$$\Delta f_{i\,max} = max_j \left| f_{ij} - f_j^* \right| ,$$

for $i = 1, 2, \ldots, m$ and $j = 1, 2, \ldots, n$.. Using the correlation coefficient $M_w\ (A_i, A^*)$ $(i = 1, 2, \ldots, m)$, the ranking order of all the alternatives and the best one(s) can be obtained.

### 2.2 Materials and methods

The development of this study was carried out in the city of Santo Domingo, Ecuador. For this, a random sample of 10 lawyers was taken, of which 5 specialized in the field of criminal defense, and 5 specialized in family defense. To be as consistent as possible, it was determined that the 10 lawyers had the greatest number of points in common.

In this way, lawyers of the same sex (male), aged between 37 and 41 years, were selected. The selected subjects belong to the same geographical area (the city of Santo Domingo) and, as far as possible, it was tried that they all had a similar standard of living (medium to medium-high), with between 6 and 8 years of experience in the field of specialization.

Before carrying out the analysis of the personality traits, it was decided, for reasons of time and functionality, the need to make a selection of the specific and timely traits to be analyzed. In accordance with [17], [18], [21], the most used neutrosophic Trait-antiTrait personality pairs are:

- Extraversion – Introversion
- Conscientiousness – unconsciousness
- Perfectionism – Imperfectionism
- Sensitivism – Insensitivism
- Novator – Conservative
- Self-esteem – Low self-esteem
- Kindness – Dislike
- Openness to intellect and experience – Closeness to intellect and experience
- Inhibition – Disinhibition
- Flexibility – Stiffness
- Emotivism – No Emotivism
- Obsessiveness- No obsessiveness
- Caution – Impulsiveness
- Timidity – Audacity
- Honesty – Dishonesty
- Hostility – No hostility.

To select which of these elements to analyze, those that have a greater general impact on the development of the professional activities of both criminal and family lawyers were prioritized. In this sense, three fundamental elements are evaluated integrally: the importance of each feature for the analysis of the cases (C1), the impact on coherent decision-making (C2), and the resilience capacity before the effects of the exercise of the profession (C3).

For the analysis and selection of the exposed personality traits with respect to the evaluation criteria to be used, the experts are asked to complete a small form. An evaluation is obtained from this form specifying, for each of the analyzed personality traits, to what extent each expert considers that the personality trait or alternative Ai is good (Tx), bad (Fx), or not completely sure (Ix) with respect to the criterion Cj. For this case, it is considered that each of the criteria evaluated has the same weight wj=0.33. Likewise, the work carried out with the experts makes it possible to determine the weighting or degree of importance for each of the criteria with respect to the rest.

The most prominent personality traits are those that allow obtaining a comparative base between the groups of lawyers that were selected for the study. In this way, 3 sessions of interviews are carried out, using a neutrosophic questionnaire {based on neutrosophic responses of the type (degree of truth (t), degree of indeterminacy (uncertainty, lack of clarity) and degree of falsehood (f) for each question} in which the selected traits are evaluated in the sampled individuals. The analyzes are carried out with the support of 2 experts in the field of psychology and

their considerations are taken into account to obtain the final results. [19], [20], [22]

## 3 Results

To carry out the described analysis, the arithmetic mean of the evaluations made by the experts is considered. The results obtained from the evaluations allow the calculation of the operators φ, μ, and ψ to obtain the correlation coefficients. Tables 1 and 2 show the results of such operations.

| Personality traits | ΔTmin | ΔImin | ΔFmin | ΔTmax | ΔImax | ΔFmax |
|---|---|---|---|---|---|---|
| Extraversion – Introversion | 0.6 | 0.2 | 0.1 | 0.9 | 0.5 | 0.2 |
| Conscientiousness – Unconsciousness | 0.4 | 0.1 | 0.2 | 0.6 | 0.1 | 0.2 |
| Perfectionism – Imperfectionism | 0.4 | 0.2 | 0.1 | 0.6 | 0.3 | 0.3 |
| Sensitivism – Insensitivism | 0.4 | 0.1 | 0.2 | 0.5 | 0.2 | 0.4 |
| Novator – Conservative | 0.4 | 0.2 | 0.1 | 0.8 | 0.5 | 0.3 |
| Self-esteem – Low self-esteem | 0.5 | 0.3 | 0.1 | 0.6 | 0.4 | 0.2 |
| Kindness – Dislike | 0.6 | 0.2 | 0.2 | 0.9 | 0.5 | 0.3 |
| Openness to intellect and experience – Closeness to intellect and experience | 0.5 | 0.2 | 0.1 | 0.9 | 0.5 | 0.2 |
| Inhibition – Disinhibition | 0.4 | 0.2 | 0.1 | 0.6 | 0.3 | 0.3 |
| Flexibility – Stiffness | 0.3 | 0.1 | 0.2 | 0.6 | 0.2 | 0.3 |
| Emotivism – Not Emotivism | 0.4 | 0.2 | 0.1 | 0.8 | 0.5 | 0.3 |
| Obsessiveness – No Obsessiveness | 0.4 | 0.3 | 0.1 | 0.8 | 0.5 | 0.2 |
| Caution – Impulsiveness | 0.6 | 0.2 | 0.2 | 0.9 | 0.5 | 0.2 |
| Timidity – Audacity | 0.2 | 0.2 | 0.1 | 0.3 | 0.5 | 0.2 |
| Honesty – Dishonesty | 0.5 | 0.2 | 0.1 | 0.6 | 0.6 | 0.2 |
| Hostility – No hostility. | 0.6 | 0.1 | 0.1 | 0.9 | 0.5 | 0.2 |

**Table 1:** Minimum and maximum values of variation in the functions of belonging to truth, falsity, and indeterminacy. Source: own elaboration

This way, by using equation (3), the values of the correlation coefficients $M_w(A_i, A^*)$ are obtained. See Table 2.

| Personality traits analyzed | φ | | | μ | | | ψ | | | coefficient M |
|---|---|---|---|---|---|---|---|---|---|---|
| | C1 | C2 | C3 | C1 | C2 | C3 | C1 | C2 | C3 | |
| Conscientiousness – unconsciousness | 0.93 | 1 | 0.8 | 1 | 0.96 | 0.87 | 1 | 0.96 | 1 | 0.57 |
| Extraversion – Introversion | 1 | 0.95 | 0.9 | 1 | 1 | 1 | 1 | 1 | 1 | 0.73 |
| Perfectionism – Imperfectionism | 0.9 | 0.95 | 1 | 1 | 0.96 | 1 | 0.92 | 0.96 | 1 | 0.67 |
| Sensitivism – Insensitivism | 1 | 0.95 | 1 | 1 | 0.96 | 0.96 | 0.92 | 1 | 1 | 0.70 |
| Novator – Conservative | 0.78 | 1 | 0.83 | 0.87 | 1 | 0.96 | 0.92 | 1 | 1 | 0.58 |
| Self-esteem – Low self-esteem | 0.95 | 1 | 0.95 | 1 | 1 | 0.96 | 1 | 0.96 | 1 | 0.64 |
| Kindness – Dislike | 1 | 1 | 0.8 | 1 | 0.96 | 0.87 | 0.96 | 1 | 1 | 0.56 |

| Personality traits analyzed | φ | | | μ | | | ψ | | | coefficient M |
|---|---|---|---|---|---|---|---|---|---|---|
| | C1 | C2 | C3 | C1 | C2 | C3 | C1 | C2 | C3 | |
| Openness to intellect and experience – Closeness to intellect and experience | 0.75 | 1 | 0.94 | 0.87 | 1 | 0.96 | 0.96 | 1 | 1 | 0.59 |
| Inhibition – Disinhibition | 0.9 | 0.95 | 1 | 1 | 0.96 | 1 | 0.92 | 0.96 | 1 | 0.67 |
| Flexibility – Stiffness | 1 | 0.9 | 0.86 | 1 | 0.96 | 1 | 0.96 | 1 | 1 | 0.70 |
| Emotivism – Not Emotivism | 0.78 | 1 | 0.83 | 0.87 | 1 | 0.96 | 0.92 | 1 | 1 | 0.58 |
| Obsessiveness - Obsessiveness | 0.78 | 0.94 | 1 | 0.95 | 1 | 0.91 | 1 | 0.96 | 1 | 0.61 |
| Caution – Impulsiveness | 1 | 1 | 0.8 | 1 | 0.96 | 0.87 | 1 | 1 | 1 | 0.58 |
| Timidity – Audacity | 0.95 | 0.95 | 1 | 0.95 | 1 | 0.91 | 1 | 0.96 | 1 | 0.65 |
| Honesty – Dishonesty | 0.95 | 1 | 0.95 | 1 | 0.95 | 0.82 | 0.96 | 0.96 | 1 | 0.61 |
| Extraversion – Introversion | 0.87 | 0.8 | 1 | 1 | 0.83 | 0.96 | 1 | 0.96 | 1 | 0.58 |

**Table 2:** Values of φ, μ, ψ, and M for each selection alternative. Source: own elaboration

According to the analysis carried out, it can be observed that the experts' criteria show 3 personality traits with the highest incidence to be analyzed by psychologists. The traits selected as a result of this were the pairs related to Extraversion – Introversion, Sensitivity – Insensitivity, and Flexibility – Rigidity.

These results laid the foundation for the analysis of the two groups of lawyers selected for the study. The results of the data obtained after the analysis by the experts are shown in Table 3.

| | | $d_{(extrovert)}$ | $d_{(introvert)}$ | $d_{extroverted\&introverted}$ | $d_{(sensitive)}$ | $d_{(insensitive)}$ | $d_{sensitive\&insensitive}$ | $d_{(flexible)}$ | $d_{(rigid)}$ | $d_{flexible\&rigid}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| **Family lawyers** | A1 | 0.54 | -0.25 | 0.29 | 0.87 | -0.21 | 0.66 | 0.67 | -0.13 | 0.54 |
| | A2 | 0.65 | -0.46 | 0.19 | 0.79 | -0.16 | 0.63 | 0.59 | -0.22 | 0.37 |
| | A3 | 0.43 | -0.33 | 0.1 | 0.59 | -0.34 | 0.25 | 0.48 | -0.28 | 0.2 |
| | A4 | 0.87 | -0.57 | 0.3 | 0.84 | -0.34 | 0.5 | 0.71 | -0.26 | 0.45 |
| | A5 | 0.53 | -0.26 | 0.27 | 0.59 | -0.4 | 0.19 | 0.74 | -0.16 | 0.58 |
| **Criminal lawyers** | A6 | 0.66 | -0.37 | 0.29 | 0.49 | -0.43 | 0.06 | 0.7 | -0.26 | 0.44 |
| | A7 | 0.76 | -0.22 | 0.54 | 0.64 | -0.34 | 0.3 | 0.68 | -0.25 | 0.43 |
| | A8 | 0.74 | -0.51 | 0.23 | 0.59 | -0.48 | 0.11 | 0.59 | -0.21 | 0.38 |
| | A9 | 0.67 | -0.3 | 0.37 | 0.54 | -0.49 | 0.05 | 0.68 | -0.3 | 0.38 |
| | A10 | 0.57 | -0.4 | 0.17 | 0.6 | -0.31 | 0.29 | 0.59 | -0.34 | 0.25 |

**Table2:** Determination of the ranges of personality traits analyzed. Source: own elaboration

These results allow the elaboration of an average graphic representation of each of the groups of lawyers that were analyzed. Figure 1 shows the average results found in each of the groups of lawyers analyzed. As can be seen, the sampled criminal lawyers turned out to be more extroverted and less sensitive than the family lawyers. The latter presented a lower average level of insensitivity than the criminal lawyers and less rigidity. No significant differences were observed regarding the level of flexibility of both groups of lawyers.

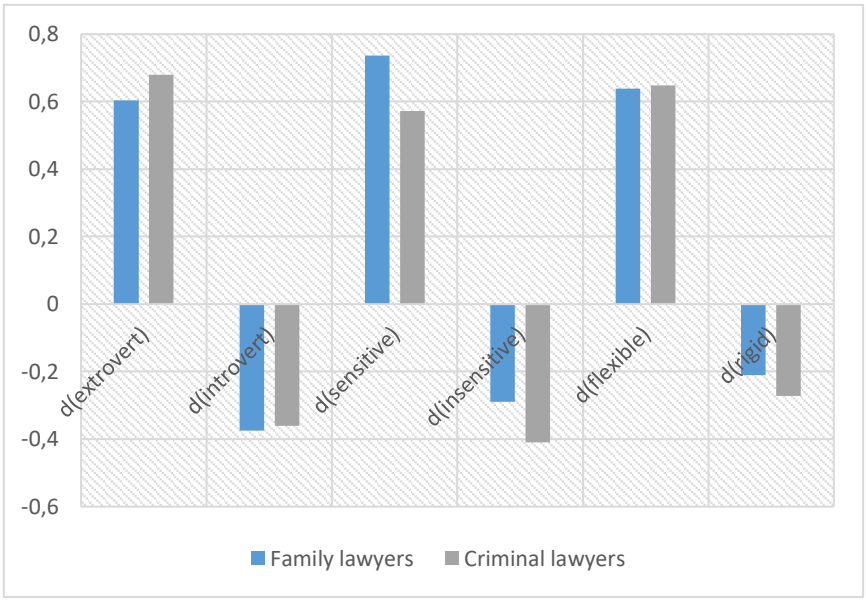


**Figure 1**: Average results of Personality Traits – Anti-Traits in each group of lawyers. Source: own elaboration

Finally, the levels obtained using the neutrosophic operator dTtrait&Antitrait (average) are compared with the values of ε and Thr set by the experts (see Figure 2).

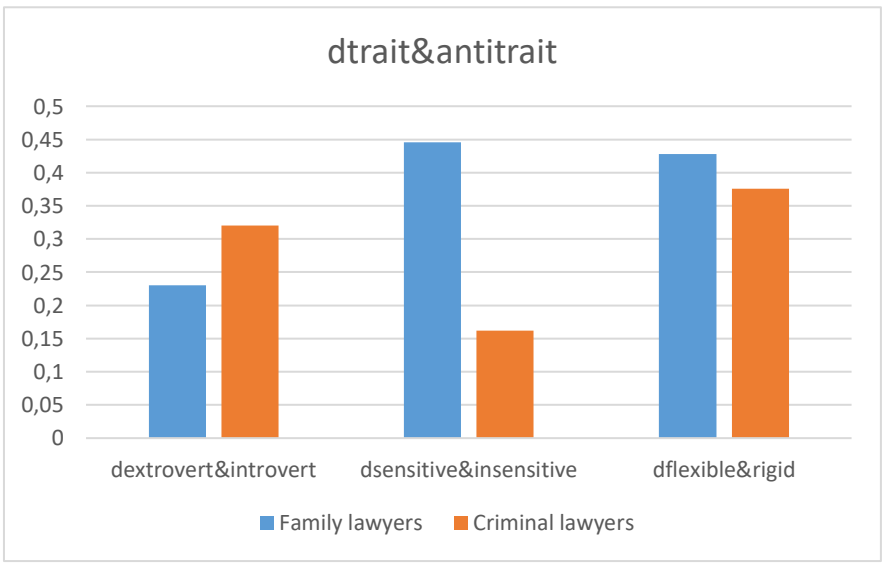


**Figure 2**: Average results of the d Personality Traits & Anti-Traits in each group of lawyers. Source: own elaboration

As can be seen, both family lawyers and criminal lawyers involved in the study have a greater tendency to be categorized as extroverted and flexible. In this sense, criminal lawyers were more extroverted and family lawyers more flexible and sensitive. On the other hand, criminal lawyers are in a state of indeterminacy between $\pm\varepsilon = 0.2$, which implies that they are close to the zero point, between sensitivity and insensitivity.

## Conclusions

Neutrosophy applied to the field of psychology is a very useful tool that allows considering the indeterminacies and subjectivities that arise in this complex and dynamic field of life. This study allowed to determine and compare different personality traits in lawyers from the city of Santo Domingo. The neutrosophic correlation was used to select the most important personality traits to be analyzed during the study. The study made it possible to determine that criminal lawyers were more extroverted and family lawyers more flexible and sensitive. On the other hand, criminal lawyers showed indeterminacy between sensitivity and insensitivity.

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