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Abstract. The psychopathic personality is the disorder of the personality characterized by antisocial behavior, lack of empathy and cruelty of the individual. This type of personality is not simple to diagnose. It is not possible to differentiate with certainty a psychopathic individual from one who is not. One measure to evaluate psychopathy is the Triarchic Psychopathy Measure (TriPM), consisting of three sub-scales that measure boldness, meanness, and disinhibition. This measure uses a Likert-type scale with 4-points. However, due to the complexity that characterizes measuring this type of personality, TriPM may be inaccurate, because four points are used instead of five. Therefore, the scale consisting of true, mostly true, mostly false, and false was modified to a new one with five elements, where indeterminacy is added. Another contribution of this paper is that the four numerical elements are replaced by a scale based on Triple Refined Indeterminate Neutrosophic Sets, where the person instead of measuring the item having a single numerical value with 100% of certainty, uses five elements with certainty between 0% and 100%. Accuracy is essential in this topic, where indeterminacy is present since psychopathy definition. Additionally, the method is illustrated with an example. Psychopathy evaluation is very important in forensic psychology, since these individuals can be involved in criminal acts.

Keywords: Triple Refined Indeterminate Neutrosophic Sets; Likert scale; psychopathic personality; Triarchic Psychopathy Measure.

1 Introduction

Psychopathy or psychopathic personality is an antisocial personality disorder[1]. Despite the popular myths about this term, scientifically there is no consensus on how to unequivocally differentiate a psychopathic person from one who is not. Two people evaluated as psychopathic do not necessarily have the same behavior. That is why the most accurate term is that of a "more or less psychopathic" person. Therefore, this type of personality is not easy to classify, which represents a challenge for the researcher who studies these individuals, [2, 3].

Some common characteristics in this personality type are its marked antisocial behavior, reduced empathy and remorse, and its uninhibited character. Psychopaths have their own code of behavior that contradicts socially accepted codes, they do not feel guilty when they transgress the social rules[4], they only feel injured when their own rules are affected.

These people know the social codes and can go unnoticed by most people; although with the pass of time their characteristics may emerge. That makes diagnosis even more difficult to achieve.

Two leading scientists who have studied this topic were Robert Hare and Hervey Cleckley. Hare created its own Psychopathy Check List, [5]. For Cleckley, psychopaths have the following characteristics, [3]:
• Superficial charm and intelligence,
• Absence of delusions or other signs of non-rational thinking,
• Absence of nervousness or psychoneurotic manifestations,
• Poor reliability,

• Falsehood or insincerity,
• Lack of remorse and shame,
• Antisocial behavior for no good reason,
• Poor judgment and difficulty learning from experience,
• Pathological self-centeredness and lack of empathy,
• Generalized poverty in the main affective relationships,
• Specific loss of intuition,
• Insensitivity in general interpersonal relationships,
• Extravagant and unpleasant behavior under the influence of alcohol and sometimes without it,
• Rarely complete suicide threats,
• Impersonal, frivolous and unstable sexual life,
• Inability to follow any life plan,
On the other hand, for Hare these personalities are characterized by:
• Great verbal ability and superficial charm,
• Exaggerated self-esteem,
• Constant need to obtain stimuli and tendency to boredom,
• Tendency to lie pathologically,
• Malicious and manipulative behavior,
• Lack of guilt or any kind of remorse,
• Frivolous affectivity, with a superficial emotional response,
• Lack of empathy. Cruelty and insensitivity,
• Parasitic lifestyle,
• Lack of control over behavior,
• Promiscuous sex life,
• History of behavior problems since childhood,
• Lack of realistic long-term goals,
• Impulsive attitude,
• Irresponsible behavior,
• Pathological inability to accept responsibility for their own actions,
• History of many short-term marriages,
• Trend toward juvenile delinquency,
• Revocation of parole,
• Versatility for criminal action.

The origin of a psychopathic personality cannot be clearly determined. Genetic and environmental factors, such as child abuse, are believed to contribute to its development. People of antisocial or alcoholic parents are at higher risk. Men have been more affected than women have. Prisons go a long way toward developing this condition in people. People who have a habit of setting fire, mistreating animals and even losing control of the urethral sphincter during childhood are linked to the development of the antisocial personality.

There are a large number of scales to measure psychopathy, [6-8]. This measurement is important, especially from the legal point of view, where it is necessary to determine whether the accused of a crime has psychopathic characteristics. It has also been determined that the non-criminal population can contain this type of people, who can commit infractions that are not detected. This article will be based on the scale called Triarchic Psychopathy Measure (TriPM) which consists of 58-items self-report inventory of psychopathy, [9, 10]. TriPM is divided into three sub-scales, each of which measures *boldness*, defined as the nexus of high dominance, low anxiousness, and venturesomeness; *meanness*, reflecting tendencies toward callousness, cruelty, predatory aggression, and excitement seeking; and *disinhibition*, reflecting tendencies toward impulsiveness, irresponsibility, oppositionality, and anger/hostility.

TriPM is based on 4-points (mostly false, false, mostly true, true) Likert-type scale, [11]. This type of scale has limitations for two reasons; firstly, it would lack a neutral element that is central in the scale that means indeterminacy. The second limitation is related to the intrinsic nature of Likert-type scales, which are numerical and only offer a single option with 100% of certainty. This is an important limitation in cases of psychopathies, which is characterized by the difficulty of measurement.

The proposal we carry out is based on Neutrosophy, [12, 13]. Neutrosophy is the branch of philosophy that studies all related to neutralities, due to the lack of information, contradictory information, paradoxical and imprecise information, among others. That is why Neutrosophy can serve to measure the degree of psychopathy, whose manifestations are characterized by indeterminacy[14]. One contribution of this paper is that for the first time Neutrosophy is used to measure psychopathies. On the other hand, the Likert scale is extended to a 5-point scale based on the Triple Refined Indeterminate Neutrosophic Set (TRINS), [15, 16], where instead of the three elements of the Single-Valued Neutrosophic Sets[17, 18], there are two more elements, the indeterminacy leaning toward truth membership and the indeterminacy leaning toward false membership. So, greater measurement accuracy is

obtained.

Neutrosophy, especially TRINS, have been used successfully to measure personality traits, [15, 16]. Additionally there is the so-called Neutrosophic Psychological Theory, [19-22], which is also called Neutropsyche. Neutrosophic Psychological Theory is defined as the psychological theory[23] that studies the soul or spirit using Neutrosophy and neutrosophic theories. It is based on triadic neutrosophic psychological concepts, procedures, ideas, and theories of the form (<A>, <neutA>, <antiA>), such as (positive, neutral, negative), and so on. Neutropsychic means of or having to do with the neutropsyche.

This paper structured into the following sections: Section of Materials and methods, contains the concepts related to Neutrosophy and TRINS. The next section includes the proposal made in this article on the measurement of psychopathic personality with the combination of TriPM questionnaire and a neutrosophic scale. An example is also offered. This paper ends with the conclusions.

2 Materials and methods

This section contains the main concepts related to Neutrosophy[24] that we use in this paper, especially Triple Refined Indeterminate Neutrosophic Sets.

Definition 1 ([15, 16])**:** The *Single-Valued Neutrosophic Set* (SVNS) N over U is A = {< x; $T_A(x), I_A(x), F_A(x) > : x \in U$}, where $T_A: U \to [0, 1]$, $I_A: U \to [0, 1]$, and $F_A: U \to [0, 1]$, $0 \leq T_A(x) + I_A(x) + F_A(x) \leq 3$.

Definition 2 ([25-30])**:** The *refined neutrosophic logic* is defined such that: a truth T is divided into several types of truths: $T_1, T_2, \ldots, T_p$, I into various indeterminacies: $I_1, I_2, \ldots, I_r$ and F into various falsehoods: $F_1, F_2, \ldots, F_s$, where all p, r, s $\geq$ 1 are integers, and $p + r + s = n$.

Definition 3 ([15, 16])**:** Consider X to be a set of points (objects) with generic entities in X denoted by x. A *Triple Refined Indeterminate Neutrosophic Set* (TRINS) A in X is considered as truth membership function $T_A(x)$, indeterminacy leaning toward truth membership function $I_{T_A}(x)$, indeterminacy membership function $I_A(x)$, indeterminacy leaning toward falsehood membership function $I_{F_A}(x)$, and falsehood membership function $F_A(x)$. Each membership function has a weight $w_m \in [0,5]$ associated with it. For each generic element x $\in$ X, there are:

$T_A(x), I_{T_A}(x), I_A(x), I_{F_A}(x), F_A(x) \in [0,1], w_T(T_A(x)), w_{I_T}(I_{T_A}(x)), w_I(I_A(x)), w_{I_F}(I_{F_A}(x)), w_F(F_A(x)) \in [0, 5]$

and

$0 \leq T_A(x) + I_{T_A}(x) + I_A(x) + I_{F_A}(x) + F_A(x) \leq 5$.

Therefore, a TRINS *A* can be represented by $A = \{ \langle x; T_A(x), I_{T_A}(x), I_A(x), I_{F_A}(x), F_A(x) \rangle | x \in X \}$.

Definition 4 ([15, 16])**:** Consider a TRINS A, its complement is denoted by $c(A)$ and is defined as

1. $T_{c(A)}(x) = F_A(x)$,
2. $I_{T_{c(A)}}(x) = 1 - I_{T_A}(x)$,
3. $I_{c(A)}(x) = 1 - I_A(x)$,
4. $I_{F_{c(A)}}(x) = 1 - I_{F_A}(x)$,
5. $F_{c(A)}(x) = T_A(x)$.

For all *x* in X.

Definition 5 ([15, 16])**:** A TRINS A is contained in another TRINS B, A $\subseteq$ B, if and only if

1. $T_A(x) \leq T_B(x)$,
2. $I_{T_A}(x) \leq I_{T_B}(x)$,
3. $I_A(x) \leq I_B(x)$,
4. $I_{F_A}(x)(x) \leq I_{F_B}(x)$,
5. $F_A(x) \geq F_B(x)$.

For all x in X.

Definition 6 ([15, 16])**:** The union of two TRINSs A and B is a TRINS C, denoted as C $=$ A $\cup$ B, whose truth membership, indeterminacy leaning toward truth membership, indeterminacy membership, indeterminacy leaning toward falsehood membership and falsehood membership functions are associated to A and B according to:

1. $T_C(x) = \max(T_A(x), T_B(x))$,

2. $I_{T_C}(x) = \max(I_{T_A}(x), I_{T_B}(x))$,
3. $I_C(x) = \max(I_A(x), I_B(x))$,
4. $I_{F_C}(x) = \max(I_{F_A}(x), I_{F_B}(x))$,
5. $F_C(x) = \min(F_A(x), F_B(x))$.

Definition 7 ([15, 16])**:** The intersection of two TRINSs A and B is a TRINS C, denoted as $C = A \cap B$, whose truth membership, indeterminacy leaning toward truth membership, indeterminacy membership, indeterminacy leaning toward falsehood membership and falsehood membership functions are associated to A and B according to:

1. $T_C(x) = \min(T_A(x), T_B(x))$,
2. $I_{T_C}(x) = \min(I_{T_A}(x), I_{T_B}(x))$,
3. $I_C(x) = \min(I_A(x), I_B(x))$,
4. $I_{F_C}(x) = \min(I_{F_A}(x), I_{F_B}(x))$,
5. $F_C(x) = \max(F_A(x), F_B(x))$.

Let *A* and *B* be two TRINS in a finite universe of discourse, $X = \{x_1, x_2, \dots, x_n\}$, which are denoted by:

$A = \{ \langle x; T_A(x), I_{T_A}(x), I_A(x), I_{F_A}(x), F_A(x) \rangle | x \in X \}$ and $B = \{ \langle x; T_B(x), I_{T_B}(x), I_B(x), I_{F_B}(x), F_B(x) \rangle | x \in X \}$,

Where $T_A(x_i), I_{T_A}(x_i), I_A(x_i), I_{F_A}(x_i), F_A(x_i), T_B(x_i), I_{T_B}(x_i), I_B(x_i), I_{F_B}(x_i), F_B(x_i) \in [0,1]$, for every $x_i \in X$. Let w_i ($i = 1,2,\dots,n$) be the weight of an element x_i ($i = 1,2,\dots,n$), with $w_i \geq 0$ ($i = 1, 2,\dots, n$) and $\sum_{i=1}^{n} w_i = 1$.

The *generalized TRINS weighted distance* is defined as follows, [15, 16]:

$$d_\lambda(A,B) = \left\{ \frac{1}{5} \sum_{i=1}^{n} w_i \left[|T_A(x_i) - T_B(x_i)|^\lambda + |I_{T_A}(x_i) - I_{T_B}(x_i)|^\lambda + |I_A(x_i) - I_B(x_i)|^\lambda + \right. \right.$$
$$\left. \left. \left| I_{F_A}(x_i) - I_{F_B}(x_i) \right|^\lambda + |F_A(x_i) - F_B(x_i)|^\lambda \right] \right\}^{1/\lambda} \qquad (1)$$

Where $\lambda > 0$.

The generalized TRINS weighted distance $d_\lambda(A,B)$ for $\lambda > 0$ satisfies the following properties:

1. $d_\lambda(A,B) \geq 0$,
2. $d_\lambda(A,B) = 0$ if and only if $A = B$,
3. $d_\lambda(A,B) = d_\lambda(B,A)$,
4. If $A \subseteq B \subseteq C$, C is a TRINS in X, then $d_\lambda(A,C) \geq d_\lambda(A,B)$ and $d_\lambda(A,C) \geq d_\lambda(B,C)$.

Definition 8 ([15, 16])**:** Let A_j ($j = 1,2,\dots,m$) be a collection of m TRINS, then the *TRINS distance matrix* $D = (d_{ij})_{m \times m}$, where $d_{ij} = d_\lambda(A_i, A_j)$ is the generalized TRINS distance between A_i and A_j and satisfies the following:

1. $d_{ij} \in [0,5], \forall i, j = 1,2,\dots,m$;
2. $d_{ij} = 0$ if and only if $A_i = A_j$;
3. $d_{ij} = d_{ji}$ for all $i, j = 1,2,\dots,m$.

Definition 9 ([15, 16])**:** The *generalized Triple Refined Indeterminate Neutrosophic weight* is defined as follows:

$$w(A) = \sum_{i=1}^{n} \left\{ w_T(T_A(x_i)) + w_{I_T}(I_{T_A}(x_i)) + w_I(I_A(x_i)) + w_{I_F}(I_{F_A}(x_i)) + w_F(F_A(x_i)) \right\} \qquad (2)$$

Where, $w_T, w_{I_T}, w_I, w_{I_F}, w_F$ denote the weights of every membership.

3 Neutrosophic TriMP measure

This section proposes a new TriMP measure based on a 5-points Likert type scale using TRINS. Below are the original questions corresponding to the three subscales about boldness, meanness and disinhibition, see [9]:

Boldness Scale items:
1. I'm optimistic more often than not.
2. I have no strong desire to parachute out of an airplane.
3. I am well-equipped to deal with stress.
4. I get scared easily.

5.   I'm a born a leader.
6.   I have a hard time making things turn out the way I want.
7.   I have a knack for influencing people.
8.   I function well in new situations, even when unprepared.
9.   I don't think of myself as talented.
10.   I'm afraid of far fewer things than most people.
11.   I can get over things that would traumatize others.
12.   It worries me to go into an unfamiliar situation without knowing all the details.
13.   I can convince people to do what I want.
14.   I don't like to take the lead in groups.
15.   It's easy to embarrass me.
16.   I stay away from physical danger as much as I can.
17.   I don't stack up well against most others.
18.   I never worry about making a fool of myself with others.
19.   I'm not very good at influencing people.

Meanness Scale items:
1.   How other people feel is important to me.
2.   I would enjoy being in a high-speed chase.
3.   I don't mind if someone I dislike gets hurt.
4.   I sympathize with others' problems.
5.   I enjoy a good physical fight.
6.   I return insults.
7.   It doesn't bother me to see someone else in pain.
8.   I enjoy pushing people around sometimes.
9.   I taunt people just to stir things up.
10.   I don't see any point in worrying if what I do hurts someone else.
11.   I am sensitive to the feelings of others.
12.   I don't have much sympathy for people.
13.   For me, honesty really is the best policy.
14.   I've injured people to see them in pain.
15.   I sometimes insult people on purpose to get a reaction from them.
16.   Things are more fun if a little danger is involved.
17.   I don't care much if what I do hurts others.
18.   It's easy for me to relate to other people's emotions.
19.   It doesn't bother me when people around me are hurting.

Disinhibition Scale items:
1.   I often act on immediate needs.
2.   I've often missed things I promised to attend.
3.   My impulsive decisions have caused problems with loved ones.
4.   I have missed work without bothering to call in.
5.   I jump into things without thinking.
6.   I've gotten in trouble because I missed too much school.
7.   I have good control over myself.
8.   I have taken money from someone's purse or wallet without asking.
9.   People often abuse my trust.
10.   I keep appointments I make.
11.   I often get bored quickly and lose interest.
12.   I have conned people to get money from them.
13.   I get in trouble for not considering the consequences of my actions.
14.   I have taken items from a store without paying for them.
15.   I have a hard time waiting patiently for things I want.
16.   I have lost a friend because of irresponsible things I've done.
17.   Others have told me they are concerned about my lack of self-control.
18.   I have robbed someone.
19.   I have had problems at work because I was irresponsible.
20.   I have stolen something out of a vehicle.

The new method consists in adapting each question, in a way that the person has the opportunity to pick between choices <A> and <anti A> with five degrees of accuracy. Always, <A> represents a no psychopathic trait of the personality, and <anti A> a psychopathic trait. Some examples of these changes are illustrated below:

The first question of boldness, which says "I'm optimistic more often than not", is substituted by:

Boldness	Q1	I'm pessimistic	1	2	3	4	5	I'm optimistic

This new scheme has different shades of evaluations. 1 represents a degree of "pessimism", 2 represents a degree of "leaning toward pessimism", 3 represents a degree of uncertainty and indeterminacy about "pessimism and optimism", 4 represents a degree of "leaning toward optimism", and 5 represents "optimism".

Question 2 of boldness can be adapted in the following way:

Boldness	Q2	I have no strong desire to parachute out of an airplane	1	2	3	4	5	I have strong desire to parachute out of an airplane

Now, the scale is interpreted as the degrees of "to have no strong desire", "leaning toward to have no strong desire", uncertainty and indeterminacy about "to have not and to have strong desire", "leaning toward to have strong desire", and "to have strong desire".

Boldness	Q3	I am not well-equipped to deal with stress	1	2	3	4	5	I am well-equipped to deal with stress

The scale is interpreted as the degrees of "not to be well-equipped", "leaning toward not to be well-equipped", uncertainty and indeterminacy about "not to be well-equipped and to be well-equipped", "leaning toward to be well-equipped", "to be well-equipped".

The last example is:

Boldness	Q4	I get scared easily.	1	2	3	4	5	I don't get scared easily.

The scale is interpreted as the degrees of "to get scared easily", "leaning toward to get scared easily", uncertainty and indeterminacy about "to get scared and to not get scared easily", "leaning toward to not get scared easily", "to not get scared easily".

One drawback of this new method with respect to the precedent one is that the former is more complex, this is the necessary disadvantage to obtain more accuracy. However, this accuracy is required because of the difficulty to capture precisely a psychopathic personality. Moreover, the complexity of the questionnaire can be dissipated if it is coded and supported with an electronic device, like a personal computer.

Let us denote with Q_{Bi} (i = 1, 2,…,19) the question with index i to measure boldness, Q_{Mi} (i = 1, 2,…,19) the question with index i to measure meanness, and Q_{Di} (i = 1, 2,…, 20) the question with index i to measure disinhibition. On the other hand, let us denote with R_{Bi} the answer to Q_{Bi} in form of TRINS, R_{Mi} the answer to Q_{Mi}, and R_{Di} the answer to Q_{Di}.

The steps to evaluate psychopathy are the following:

1. The person answers the questions using the new scale. This step may needs of the help of a specialist. Thus, R_{Bi}, R_{Mi}, and R_{Di} are obtained. To make the evaluation easier, the specialist may indicate to the person to evaluate each point of the scale (from 1 to 5) in a value from 0 to 10, then, this value is divided by 10 and the TRINS is obtained.

2. The average of $R_{Bi} = \langle T(R_{Bi}), I_T(R_{Bi}), I(R_{Bi}), I_F(R_{Bi}), F(R_{Bi}) \rangle$, $R_{Mi} = \langle T(R_{Mi}), I_T(R_{Mi}), I(R_{Mi}), I_F(R_{Mi}), F(R_{Mi}) \rangle$, and $R_{Di} = \langle T(R_{Di}), I_T(R_{Di}), I(R_{Di}), I_F(R_{Di}), F(R_{Di}) \rangle$ are calculated with formulas in Equation 3:

$$\overline{R}_B = \langle \frac{\sum_{i=1}^{19} T(R_{Bi})}{19}, \frac{\sum_{i=1}^{19} I_T(R_{Bi})}{19}, \frac{\sum_{i=1}^{19} I(R_{Bi})}{19}, \frac{\sum_{i=1}^{19} I_F(R_{Bi})}{19}, \frac{\sum_{i=1}^{19} F(R_{Bi})}{19} \rangle$$

$$\overline{R}_M = \langle \frac{\sum_{i=1}^{19} T(R_{Mi})}{19}, \frac{\sum_{i=1}^{19} I_T(R_{Mi})}{19}, \frac{\sum_{i=1}^{19} I(R_{Mi})}{19}, \frac{\sum_{i=1}^{19} I_F(R_{Mi})}{19}, \frac{\sum_{i=1}^{19} F(R_{Mi})}{19} \rangle \qquad (3)$$

$$\overline{R}_D = \langle \frac{\sum_{i=1}^{20} T(R_{Di})}{20}, \frac{\sum_{i=1}^{20} I_T(R_{Di})}{20}, \frac{\sum_{i=1}^{20} I(R_{Di})}{20}, \frac{\sum_{i=1}^{20} I_F(R_{Di})}{20}, \frac{\sum_{i=1}^{20} F(R_{Di})}{20} \rangle$$

3. The index to measure the psychopathic personality is calculated with formula 4:

$$PI = \overline{R}_B \cap \overline{R}_M \cap \overline{R}_D \qquad (4)$$

4. To obtain a unique crisp value, calculate $w(PI)$, the generalized Triple Refined Indeterminate Neutrosophic weight with Equation 2, thus, $dp = round\left(\frac{w(PI)}{3}\right)$ indicates the degree of phychopathy of the person in the following scale:

$$\left\{ \begin{array}{c} dp \leq 1: \text{Non psychopathic personality} \\ dp = 2: \text{leaning toward non psychopathic personality} \\ dp = 3: \text{Indeterminacy on psychopathic and non psychopathic personality} \\ dp = 4: \text{leaning toward psychopathic personality} \\ dp = 5: \text{psychopathic personality} \end{array} \right\}$$

Example 1:

This example serves to illustrate the applicability of the neutrosophic TriMP scale in a hypothetical case. Tables 1, 2 and 3, summarize the responses of a hypothetical person about boldness, meanness, and disinhibition, respectively.

Question	R_{Bi}
Q1	$\langle 0.30, 0.10, 0.60, 0.00, 0.00 \rangle$
Q2	$\langle 0.10, 0.50, 0.40, 0.00, 0.00 \rangle$
Q3	$\langle 0.30, 0.30, 0.40, 0.00, 0.00 \rangle$
Q4	$\langle 0.40, 0.60, 0.00, 0.00, 0.00 \rangle$
Q5	$\langle 0.00, 0.00, 0.40, 0.30, 0.30 \rangle$
Q6	$\langle 0.20, 0.50\ 0.30, 0.00, 0.00 \rangle$
Q7	$\langle 0.00, 0.00, 0.10, 0.20, 0.70 \rangle$
Q8	$\langle 0.50, 0.20, 0.30, 0.00, 0.00 \rangle$
Q9	$\langle 0.60, 0.40, 0.00, 0.00, 0.00 \rangle$
Q10	$\langle 0.00, 0.00, 0.30, 0.30, 0.40 \rangle$
Q11	$\langle 0.00, 0.00, 0.40, 0.40, 0.20 \rangle$
Q12	$\langle 0.10, 0.60, 0.20, 0.10, 0.00 \rangle$
Q13	$\langle 0.30, 0.40, 0.20, 0.10, 0.00 \rangle$
Q14	$\langle 0.00, 0.00, 0.30, 0.30, 0.40 \rangle$
Q15	$\langle 0.20, 0.40, 0.40, 0.00, 0.00 \rangle$
Q16	$\langle 0.00, 0.00, 0.00, 0.70, 0.30 \rangle$
Q17	$\langle 0.40, 0.60, 0.10, 0.00, 0.00 \rangle$
Q18	$\langle 0.30, 0.30, 0.40, 0.10, 0.00 \rangle$
Q19	$\langle 0.00, 0.50, 0.50, 0.00, 0.00 \rangle$

Table 1: Responses to the questionnaire about boldness.

Question	R_{Mi}
Q1	$\langle 0.00, 0.20, 0.10, 0.30, 0.40 \rangle$
Q2	$\langle 0.00, 0.40, 0.20, 0.30, 0.00 \rangle$
Q3	$\langle 0.00, 0.00, 0.10, 0.60, 0.00 \rangle$
Q4	$\langle 0.00, 0.00, 0.30, 0.60, 0.30 \rangle$
Q5	$\langle 0.00, 0.20, 0.20, 0.60, 0.00 \rangle$
Q6	$\langle 0.00, 0.20, 0.70, 0.1, 0.00 \rangle$
Q7	$\langle 0.00, 0.00, 0.1, 0.50, 0.50 \rangle$
Q8	$\langle 0.10, 0.10, 0.20, 0.70, 0.00 \rangle$
Q9	$\langle 0.40, 0.50, 0.10, 0.00, 0.00 \rangle$

Q10	$\langle 0.30, 0.60, 0.10, 0.00, 0.00 \rangle$
Q11	$\langle 0.00, 0.10, 0.10, 0.20, 0.70 \rangle$
Q12	$\langle 0.00, 0.30, 0.20, 0.50, 0.00 \rangle$
Q13	$\langle 0.00, 0.00, 0.70, 0.30, 0.10 \rangle$
Q14	$\langle 0.00, 0.30, 0.10, 0.50, 0.00 \rangle$
Q15	$\langle 0.00, 0.10, 0.50, 0.40, 0.00 \rangle$
Q16	$\langle 0.20, 0.10, 0.20, 0.50, 0.00 \rangle$
Q17	$\langle 0.60, 0.20, 0.20, 0.00, 0.00 \rangle$
Q18	$\langle 0.00, 0.50, 0.20, 0.30, 0.00 \rangle$
Q19	$\langle 0.10, 0.60, 0.30, 0.20, 0.00 \rangle$

Table 2: Responses to the questionnaire about meanness.

Question	R_{Di}
Q1	$\langle 0.20, 0.50, 0.30, 0.00, 0.00 \rangle$
Q2	$\langle 0.20, 0.60, 0.20, 0.00, 0.00 \rangle$
Q3	$\langle 0.30, 0.30, 0.40, 0.00, 0.00 \rangle$
Q4	$\langle 0.00, 0.40, 0.10, 0.50, 0.00 \rangle$
Q5	$\langle 0.00, 0.30, 0.50, 0.20, 0.00 \rangle$
Q6	$\langle 0.10, 0.20, 0.50, 0.20, 0.00 \rangle$
Q7	$\langle 0.00, 0.00, 0.30, 0.20, 0.40 \rangle$
Q8	$\langle 0.00, 0.40, 0.20, 0.40, 0.00 \rangle$
Q9	$\langle 0.00, 0.00, 0.40, 0.10, 0.40 \rangle$
Q10	$\langle 0.00, 0.00, 0.00, 0.60, 0.40 \rangle$
Q11	$\langle 0.00, 0.10, 0.30, 0.50, 0.20 \rangle$
Q12	$\langle 0.30, 0.40, 0.30, 0.10, 0.00 \rangle$
Q13	$\langle 0.00, 0.50, 0.20, 0.20, 0.10 \rangle$
Q14	$\langle 0.00, 0.00, 0.50, 0.50, 0.00 \rangle$
Q15	$\langle 0.00, 0.10, 0.60, 0.30, 0.00 \rangle$
Q16	$\langle 0.30, 0.70, 0.00, 0.00, 0.00 \rangle$
Q17	$\langle 0.00, 0.00, 0.60, 0.40, 0.00 \rangle$
Q18	$\langle 0.20, 0.50, 0.30, 0.00, 0.00 \rangle$
Q19	$\langle 0.30, 0.30, 0.50, 0.00, 0.00 \rangle$
Q20	$\langle 0.30, 0.50, 0.20, 0.30, 0.00 \rangle$

Table 3: Responses to the questionnaire about disinhibition.

Then, we have when applying Equation 3 that $\overline{R}_B = \langle 0.19474, 0.28421, 0.27895, 0.13158, 0.12105 \rangle$, $\overline{R}_M = \langle 0.089474, 0.231579, 0.242105, 0.347368, 0.105263 \rangle$, and $\overline{R}_D = \langle 0.110000, 0.290000, 0.320000, 0.225000, 0.075000 \rangle$. From Equation 4, PI $= \langle 0.089474, 0.231579, 0.242105, 0.131580, 0.121050 \rangle$, thus, from Equation 2 we have dp $= round(2.4105) = 2$, therefore, the personality of this person is classified as "leaning toward non psychopathic personality".

Conclusion

To diagnose a psychopathic personality is complex, due to the indeterminacy of its definition, thus, an accurate evaluation is essential to measure this type of personality. Additionally, this assessment is important in forensic psychology in offenders and non-offenders persons. Triarchic Psychopathy Measure is a 4-point Likert-type measure to self-evaluation based on a questionnaire and three subscales of boldness, meanness, and disinhibition. This paper proposes a new measure, which uses Triple Refined Indeterminate Neutrosophic Sets. The advantage of this new technique is that it is more accurate than the original, because we propose a 5-point scale, and additionally the neutrosophic Likert allows us to select the five options with a degree of certainty, instead of only one option with a 100% of certainty. The output of the method is a value belonging to a 5-point classification, in a comprehensible way for the person and the specialist. With this new scale, the person can widely express its feelings and thoughts, which can be conditioned by the ambiance of the location where the test is carried out. Finally, we illustrated with a hypothetical example how to use the method.

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