Neutrosophic Degree of a Paradoxicity

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1. Definition of a **Paradox**.

A paradox is called a statement <P> which is true and false in the same time.
Therefore, if we suppose that statement <P> is true, it results that <P> is false; and reciprocally, if we suppose that <P> is false, it results that <P> is true.

2. But there are statements that do not completely obey this definition.

We call a **Semi-Paradox** a statement <SP> such that either supposing that <SP> is true it results that <SP> is false (but not reciprocally), or supposing that <SP> is false it results that <SP> is true (but not reciprocally).
So, the statement has a degree of 0.50 (50%) of a paradox, and 0.50 of a non-paradox.

3. Three-Quarters Paradox.

3.1. Definition.
There are cases when a statement <QP> can be between a paradox and a semi-paradox. For example:

a) If we suppose that the statement <QP> is true, it results that <QP> is false, but reciprocally if we suppose that the statement <QP> is false, it may be possible resulting that <QP> is true. Therefore, the second implication (conditional) does not always occur.
b) Or, if we suppose that the statement <QP> is false, it results that <QP> is true, but reciprocally if we suppose that the statement <QP> is true, it may be possible resulting that <QP> is false. Therefore, the second implication (conditional) does not always occur.

In this case we may have a degree of paradoxicity in between 0.50 and 1, actually in a neighborhood of 0.75.
These types of fuzzy and especially neutrosophic implications are derived from the fuzzy or neutrosophic logic connectives.

3.2.See some **Examples of Three-Quarters Paradoxes**

Social Three-Quarters Paradox:
In a democracy should the non-democratic ideas be allowed?
a) If no, i.e. other ideas are not allowed - even those non-democratic -, then one not has a democracy, because the freedom of speech is restricted.
b) If yes, i.e. the non-democratic ideas are allowed, then one might end up to a non-democracy (because the non-democratic ideas could overthrow the democracy as, for example, it happened in Nazi Germany, in totalitarian countries, etc.).

Three-Quarters Paradox of Freedom of Speech & Religion (I):

As a freedom of speech do we have the right to insult religion?

a) If not, then we don't have freedom of speech.

b) If yes, i. e. we have the right to insult religion, then we don't respect the freedom of faith.

Devine Three-Quarters Paradox (II):

Can God prove He can commit suicide?

a) If not, then it appears that there is something God cannot do, therefore God is not omnipotent.

b) If God can prove He can commit suicide, then God dies - because He has to prove it, therefore God is not immortal.

Devine Three-Quarters Paradox (III):

Can God prove He can be atheist, governed by scientific laws?

a) If God cannot, then again He's not omnipotent.

b) If God can prove He can be atheist, then God doesn't believe in Himself, therefore why should we believe in Him?

Devine Three-Quarters Devine Paradox (IV):

Can God prove He can do bad things?

a) If He cannot, then He is not omnipotent, therefore He is not God.

b) If He can prove He can do bad things, again He's not God, because He doesn't suppose to do bad things.

Devine Three-Quarters Paradox (V):

Can God create a man who is stronger than him?

a) If not, then God is not omnipotent, therefore He is not God.

b) If yes, i. e. He can create someone who is stronger than Him, then God is not God any longer since such creation is not supposed to be possible, God should always be the strongest.

{God was egocentric because he didn't create beings stronger than Him.}

Devine Three-Quarters Paradox (VI):

Can God transform Himself in his opposite, the Devil?

a) If not, then God is not omnipotent, therefore He is not God.

b) If yes, then God is not God anymore since He has a dark side: the possibility of transforming Himself into the Devil [God doesn't suppose to be able to do that].

4. In general we have the following **Degree of a Paradox**:

Let's consider a statement <DP>.

(α) If we suppose that the statement <DP> is true it may result that <DP> is false, and reciprocally *(β)* if we suppose that the statement <DP> is false it may result that <DP> is true. Therefore, both implications (conditionals) depend on other factors in order to occur or not, or

partially they are true, partially they are false, and partially indeterminate (as in neutrosophic logic).

5. **Discussion**.

This is the general definition of a statement with some degree of paradoxicity.

a) If both implications (α) and (β) are true 100%, i.e. the possibility "it may result" is replaced by the certitude "it results" we have a 100% paradox.

b) If one implication is 100% and the other is 100% false, we have a semiparadox (50% of a paradox).

c) If both implications are false 100%, then we have a non-paradox (normal logical statement).

d) If one condition is p% true and the other condition q% true (truth values measured with the fuzzy logic connectives or neutrosophic logic connectives), then the **degree of paradoxicity** of the statement is the average $\frac{p+q}{2}$ %.

e) Even more general from the viewpoint of the neutrosophic logic, where a statement is *T%* true, *I%* indeterminate, and *F%* false, where *T, I, F* are standard or non-standard subsets of the non-standard unit interval $]^{-}0, 1^{+}[$.
If one condition has the truth value (T_1, I_1, F_1) and the other condition the truth value (T_2, I_2, F_2), then the **neutrosophic degree of paradoxicity** of the statement is the average of the component triplets:

$$(\frac{T_1+T_2}{2}, \frac{I_1+I_2}{2}, \frac{F_1+F_2}{2}),$$

where the addition of two sets A and B (in the case when T, I, or F are sets) is simply defined as:

$$A + B = \{x \mid x = a + b \text{ with } a \in A \text{ and } b \in B\}.$$

6. **Comment.**

When T, I, F are crisp numbers in the interval [0, 1], and I = 0, while T + F = 1, then the neutrosophic degree of paradoxicity coincides with the (fuzzy) degree of paradoxicity from d).

Reference:

Smarandache, Florentin, "*Neutrosophy. / Neutrosophic Probability, Set, and Logic*", American Research Press, Rehoboth, 1998.