

ADVANCING AFRICAN LOGIC BEYOND IJIOMAH'S HARMONIOUS MONISM

Gideon Idike Owo

&

Edwin O. Otu

Abstract

This article is a critique of recent propositions about African logic. First, it argues that African logic has its peculiar structure and its unique principles can be applied by anyone who understands them. In this regard, the paper interrogates the views of two experts on African philosophy who conceptualize the structure of African logic as either peculiar to Africa and Africans or derived from the system of Western logic that was systematized by Aristotle. Second, the article explicates a dilemma in Ijiomah's account of a trivalent system of African logic known as Harmonious monism. Ijiomah's dilemma is traced to his view that Harmonious Monism is restricted to Africa. If one restricts the scope of African logic to Africa, then the proposition of Ijiomah concerning the universal applicability of logical principles will be jettisoned. Contrary to the view of Ijiomah, the article upholds that Harmonious Monism is not the only system of logic that can be validly developed from the African context, and that its principles can be applied beyond Africa.

Keywords: *African logic, Chris Ijiomah, Harmonious monism, Logical Relativism, Logical universalism*

Introduction

Logic as the science of valid and sound argumentation is at the heart of philosophy. It is an instrument with which philosophy is carried out. As an instrument, it provides philosophers with the wherewithal for philosophizing in their respective traditions of philosophy. However, do all traditions of philosophy operate with the same system of logic? There are at least two possible responses to the question. The first response affirms that all traditions of philosophy make use of the same logic. This position amounts to Logical Universalism. Scholars who support this position include Innocent I. Asouzu (2013), Uduma O. Uduma (2015a; 2015), and Victor Nweke (2014). Exponents of Logical Universalism maintain that all human thought patterns and processes are the same, and since logic deals with human thought processes, then the same system of logic could be found across all human cultures. What this comes to is that there is no peculiar regional logic such as African logic, Oriental logic or Western logic. The second response denies that every tradition of philosophy makes

use of the same system of logic. And this second option supports Logical Relativism. Those who hold this view include Kane C. Anyanwu (1987; 2000), Udo Etuk (2002), Campbell S. Momoh (2000), Chris. O. Ijiomah (2000; 2006; 2014; 2016), and Chimakonam (2011; 2013). Their argument is that every philosophy tradition has its own peculiar logic.

It is on the premise of the second postulation that African logic is developed. This African logic is three-valued logic, but not of the Western type (details of this will be stated later). This logic has been argued to be a peculiar African logic derived from African culture and worldview and that it is predicated on African ontology, that is, the African conception of reality (Apebende 2016, 88-91). If it is factual that Africa has a peculiar logic, it is incumbent on African philosophers to give a detailed explanation of its nature. This is what scholars such as Ijiomah and Chimakonam have done in their respective works on the question of African logic. Their views are somehow related with little differences. Beside this, Ijiomah and Chimakonam have done African philosophy and philosophers a great service by developing two distinct systems of African logic known as 'Harmonious Monism' and 'Ezumezu logic', respectively.

Our objectives in this article are twofold. The first is to examine the trivalent nature of African logic. In this respect, we shall restrict our scope more to the work of Ijiomah with relevant references to the works of other scholars whose views have bearing with his perspective. We shall also engage the works of Ijiomah with the view of highlighting, deconstructing and constructing/reconstructing the dilemmas inherent in his idea of African three-valued logic. This discourse will be undertaken in the second section on 'Beyond the Dilemmas in Ijiomah's Harmonious'. Our second objective is to unveil the foundation of African three-valued logic and its support for logical pluralism.

Conceptualizing African Logic

Logic is a branch of philosophy that should be taken seriously if one must understand philosophy or any branch of philosophy. This is because some scholars hold that logic is philosophy. One of such scholars is Uduma, who asserts that “philosophy is only possible as logic; in other words, philosophy is logic” (2015a, 26). Hence, if one is talking about logic the person is talking about philosophy. There is also the widely held view that logic is not philosophy but a branch of philosophy. In other words, logic is an area of specialism in philosophy; it is a branch of philosophy. The term logic is derived from the Greek word *λογος* (*logos*), meaning word, discourse, reason, science, study and thinking or thought. From these etymological connotations, it can be said that logic is a science that is concerned with the discursive use of words (language) to express thought. Simply put, logic is an expression of thought through language. Language is the vehicle of thought which depicts a peoples’ logic. It is in the language of a people that their logic is manifested; and as an expression of a peoples’ thought it leads to conclusion on the logicity of the people. A peoples’ thought is logical only when it is rational in its expression; illogical when it is irrational. The word rationality is here used synonymously with reason.

Reason or reasoning is another concept that can be used to defined logic. Here, logic is said to be the principle of reasoning, but not any kind of reasoning. It is the principle of coherent, sound and valid reasoning. It involves the methods and principles with which one can distinguish between sound and unsound reasoning or, correct and incorrect reasoning. Umeogu expresses this thus:

Logic is the art and science of the production of valid thought.

It is the method and system of principles that order life of reasoning, as it reasons about reality. It is the fundamental principles and law of all mental processes, that is, the necessary

connection between premises and conclusion, between reality and consciousness (2012, 38).

The deduction that can be made from the above assertion is that logic also deals with argument[s] alongside human reasoning (Nweke 2014, 25). It is concerned with how the mind coherently connects a thought to another or a premise to another premise or premises to conclusion. This is what is called argument. Defining logic in terms of argument, Umeogu quotes Baum as saying that “logic is concerned with the process of reasoning used to arrive at conclusions, more specifically, it is concerned with the relationship between a particular and the reasons offered to support it” (1996, 2). Also, the evaluation of argument or validation of judgment using some methods or principles is called ‘logic’ (Uduma 2004, 1, 2; Umeogu 1996, 2). This is done in an intelligent manner. This shows the link between logic and intelligibility. Logic is also defined in terms intelligibility. Logic is the principle of intelligibility. It is after how intelligible a proposition or conclusion is in relation to other propositions.

Logic is classed into informal and formal logic. Informal logic is also known as natural logic or ordinary language logic (Momoh 2001, 139). It is a logic that is found in natural language. Momoh elaborates this conception of informal or natural logic as follows:

By “natural logic” we mean logic in natural language, the use of logic in everyday reasoning and discussion. This sense of logic relates to how critical, discriminating, rational and reasonable the normal average human being is in discussion, discourse and arguments. In this first sense, logic is concerned with clarity of expression, coherence and consistency, and the avoidance of vagueness, ambiguity and fallacies and contradictions (2001, 139).

In this case, to be logical is to be intelligible, rational, sensible, consistent, coherent, and to live beyond contradictions. It is therefore apparent that all humans in this sense are logical. That is to say, there is no culture without individuals who can reason and express themselves intelligibly, consistently, coherently, sensibly, rationally and devoid of contradictions. This logic is universal and found in all human cultures.

What can be inferred from the above is that the other type of logic, that is, formal logic is not universal. It is found in some cultures and absent in other cultures [but this is not actually the case]. Formal logic is also called symbolic or artificial logic. There are also other names that this logic is associated with. These include: logistic, mathematical logic, deductive logic, rational logic. All these nomenclatures are used interchangeably with formal logic, artificial logic and symbolic logic although not always (Momoh 2001, 139). This logic is derived from informal logic or natural language logic. Writing about this logic, Momoh notes that “Formal logic is concerned with the form, structure or schema of arguments translated from natural language into artificial language, and manufactured with the aid of symbols, connectives and rules of inference and transformation” (2001, 142). Formal logic is different from informal logic in that “the language of formal logic differs from that of everyday life because it is essentially a rationally planned language” (Hogben quoted in Momoh 2001, 142). It must be noted that these artificial symbols, connectives and rules are given meaning by their investors. Thus, their meaning is contextual and guided by well-defined set of rules.

It is this second sense of logic that was denied Africa/ns. The Westerners and some Western trained African scholars argue that Africa/ns are irrational because they do not have this kind of logic. For instance, Horton notes that “traditional cultures, though eminently logical, have never felt the need to develop logic [formal logic]” (1977, 65). Hence, this logic is seen as Western and that it is Aristotelian two-valued logic of the Western tradition that

embodies and perfectly represents this logic. This is a formalized logic. What this leads to is that logic is solely formal and nothing else (Ruch 1977, 267). It is in this manner that it is noted that logic is a “theory of formal inference” (Uduma 2004, 245). The extreme to this, is the view that logic as formal logic is science of the formal structure of thought and deriving of inference. This implies that logic is the science of the principles of formal structure of valid arguments with no interest on the content of the arguments [informal logic]. Without concern for the truthfulness of the premises, it is after whether the conclusion is deduced strictly from, or entailed in, the premises. Its main concern is consistency and validity and has nothing to do with the truth (Umeogu 1996, 8; Nweke 2014, 26). However, is it true that logic is solely formal logic?

Logic is both formal and informal. It is not solely formal. It is a discipline that is primarily concerned with the consistency and validity of premises or conclusion as well as their truthfulness. Any thought system that is devoid of this cannot be said to be logical. So, logic cannot be restricted to formal logic. The other issue to note is that what is known as formal logic is derived from informal logic. Hence, without informal logic there will be no formal logic. Therefore, to restrict logic to formal logic is absolute nonsensical. It is like talking about a building without its foundation. Going by the fact that formal logic is derived from informal logic, it is possible to deduce formal logic from the natural language of all human cultures. While informal logic can be used by anyone within any given culture, formal logic can only be used by trained logicians and philosophers (Momoh 2000, 180). It is on this premise that African logic can be said to have stemmed from African culture. Also, it can be said that African logic is not restricted to informal logic but that formal logic is deduced from it. What this entails is that African logic is both informal and formal logic. After affirming the existence of African logic, Umeogu therefore defined it as follows:

African logic is a symbolismic logic of existence, wherein by way of integro-differential interject premise(s) of connected material or non-material symbolic experience, dialectical inference(s) is/are immediately or mediately or non-mediately made that is/are interductive in meaningfulness (1996, 157).

This definition of African logic shows that African logic is not restricted to informal logic but that it is also formal.

In line with the above understanding of African logic, it can be said that African logic is the instrument with which African philosophers and logicians study the inherent relations between and among realities in order to develop appropriate systems and criteria for the evaluation of arguments about the nature of any given reality. This African logic also reflects the nature of the reality that it studies. It is this issue that will be considered in the next section.

The Nature of African Logic and its Ontological Root

It is an undisputed fact that what is generally called African logic today is three-valued. It is pertinent to note that what has not been made clear is the actual nature of this logic. Opinions vary among African philosophers who have delved into discussing this issue. It is to articulate what I see as the actual nature of this African three-valued logic that this section becomes pertinent. I will start my discourse with Ijiomah's version.

Ijiomah gives a structure of African logic that is worthy of examining. The reason for starting with his version is borne out of my belief that he is the first African philosopher to give an actual picture of the structure of African three-valued logic. Although Meinrad Hebga has earlier on pre-empted what looks like a three-valued logic in the 1960s, his view does not give us an actual image of African logic as three-valued. It is germane to note that Hebga gives an imagery of African three-valued logic in his argument advanced against the

absolutization of the Western two-valued logic as the only system of logic for all civilizations and cultures (1958, 222). According to him,

In this bivalent there is no place except for the true and false. It excludes all intermediary value such as the ‘not altogether true’ and ‘not altogether false’. This basis of this bivalence seems to be the ambiguity of the intermediate value or, rather, the demands of the principle of contradiction which excludes one thing from being true and false at the same time under the same aspect (1958, 223).

Yes, in this assertion is a shadow of African three-valued logic, but it does not give us what Ijiomah did several years later. Ijiomah makes it apparent that African logic is three-valued in that it consists of ‘true’, ‘false’ and ‘true and false’ values, contrary to Western three-valued logic, which has an indeterminate third value. Ijiomah’s picture of the structure of this logic can be represented as follows:

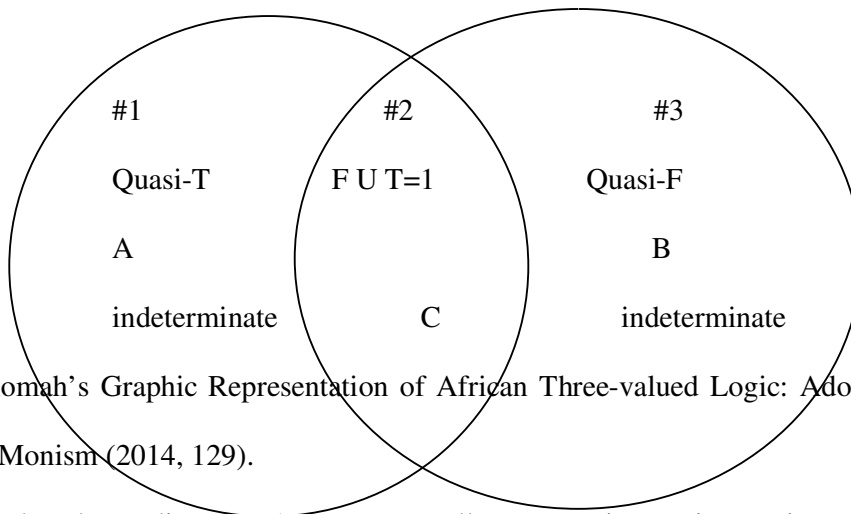


Figure 1: Ijiomah’s Graphic Representation of African Three-valued Logic: Adopted from Harmonious Monism (2014, 129).

From the above diagram, A is not actually true. It is quasi-true since it has the properties of truth. Also, B is not actually false. It is quasi-false, being that it has the properties of falsity. It is only C that is real. It is that which has both true and false within it; making it the only determined value while others are undetermined. This pictorial

representation of African three-valued logic does not really correspond to three-valuedness that Ijiomah claims for African logic. Quasi-true and quasi-false are not true and false and therefore cannot depict true and false as Ijiomah would wish us believe. If this is accepted to be the case, then African logic is one-valued logic.

However, Ijiomah's graphic representation of African logic is not three-valued in the African sense. Rather, it is like Western three-valued which metamorphosizes on its own into two-valued logic. Reality, as expressed by African philosophers and scholars, is one that consists of spirit and matter or spiritual and material elements (Anyanwu 2000, 90; Iroegbu 2002, 28; Unah 2009, 48; Okoro 2008, 36; Chimakonam and Ogbonnaya 2011, 276; Ijiomah 2005, 76, 78). That is to say, $R = S + M$.

Where:

R = Reality

S = Spirit or Spiritual element

M = Matter or Material element

This is known as theory of duality (Edeh 1985, 74), *inseparable duality* (Onunwa 2005, 110), complementary duality (Animalu and Chimakonam 2012, 142), harmonious duality (Ogbonnaya 2017, 82). This is not what Ijiomah's idea of African three-valued logic represents. His version of African logic represents dualistic conception of reality in Western philosophy tradition. It is an 'either this or that' logic and conception of reality. African three-valued logic follows an inclusive 'this and that' conception of reality. This reflects a cyclical conception of reality embedded within the African worldview. Here, "[t]he spiritual appears as physical reality and goes back to the spiritual world and the cycle continues. This means that the physical has an inbuilt spirituality and the spiritual an inbuilt physicality" (Ijiomah 2014, 119). Therefore, there is an internal harmonious relationship of realities in the African reality scheme such that two distinct elements are interwoven as one following the

internal relational law and dynamic (Iroegbu 1995, 287). This is a true picture of African theory of duality. This conception leads to triadic [three-dimensional] conception of reality as well as Trinitarian and trivalent thinking. This conception of reality can be depicted as follows:

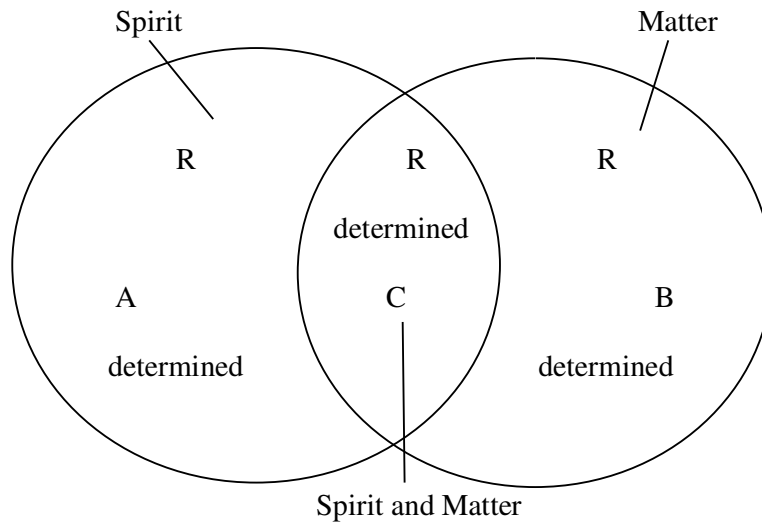


Figure 2: A Graphic Representation of African conception of the nature of reality

It is apparent from the above diagram that C is real, while A and B are context-dependent. In a context, reality [R] may be seen as either A [solely spiritual] or B [solely material] and in each of these contexts it is seen as real. Hence, reality is A, B and C that is, spirit, matter and spirit and matter respectively.

Trailing the above analysis and argument, Ijiomah is not right in his representation of African three-valued logic. What is factual is that there is nothing like quasi-truth and quasi-false in this system of logic. Therefore, African system of three-valued logic consists of ‘true’, ‘false’ and, ‘true and false’. What this section brings one to is: *African logic is a system of logic or principle of intelligibility about reality articulated from the intellectual heritage of Africa with the stamp of the trivalent structure of the pristine African thought system.* With this point established, it is pertinent to interrogate in order to reconstruct some problematics in Ijiomah’s and Chimakonam’s systems of African three-valued logic.

Beyond Ijiomah's Harmonious Monism

The goal of Ijiomah and Chimakonam is to develop a distinct system of logic for African civilization and culture. This is apparent in their systems of logic, *Harmonious Monism* and *Ezumezu logic*, respectively. A careful examination of these systems presents some problematics that need to be pointed out and addressed. It is this that forms the objective of this section. It is good to start with Ijiomah's system of logic.

Ijiomah is the originator of the system of African three-valued logic known as Harmonious Monism. He sees this logic system as peculiarly African; and such is derived from, and is applicable only within, Africa. This follows strictly the culture-bound theory. This theory holds that every culture has its own way of perceiving reality and that this perception of reality is not the same with the way other cultures conceive the same reality. It is in this light that Ijiomah limits and restricts African three-valued logic to Africa. His argument is that Aristotelian two-valued logic is Western logic by origin and it is not applicable in the explanation of reality in Africa. So, for him, there is the need to develop a logic that will be applicable in the explanation of reality in Africa. This logic must then be a logic that is domiciled in Africa. C. E. Okankan shares in this view of Ijiomah as he asserts that "for any discipline to pass as African logic, it must meet the criteria of origin, domicile and interest" (2017). Okankan interprets this assertion as follows:

By origin, we mean that logic evolves with the people as they grow up and become part and parcel of them. By domicile, we mean that it is only inherent and peculiar to the African soil (that is, it is always found in Africa). By interest, we mean that it focuses its concentration, interrogation, and meditation on the logical peculiarities of Africa and the people of Africa. (2017, np)

What this amount to is that for any logical system to be African, it must meet the above mentioned three criteria. It is in line with this thought that Cyril Etim posits: “African logic is a specific kind of logic which has its root in the cultural heritage of Africa, formulated out of the experiences of her people and aimed at serving their common interest” (2015, 128). Even earlier Chimakonam have argued in this way that African three-valued logic system is peculiarly African (2011, 149-150; 2013, 409, 422). The bottom line in the argument of Ijiomah and his disciples is that African logic can only serve African society from where it is derived, just like Western logic which is peculiarly Western in origin and applicability.

The above conclusion contradicts some of the strong assertions made by Ijiomah in the course of developing his system of three-valued logic. One of such assertions is “wherever something stands, something also will stand beside it” (1996, 45). It should be noted that what stands with it is what it is not, it is something else. What can be deduced from this is that no system of logic stands in isolation. All systems of logic stand in relation to other systems of logic. No system of logic is all sufficient to explain reality and human experiences within a given culture. However, the very fact that Ijiomah argues that African three-valued logic is restricted to Africa by origin and applicability, shows that he does not see the possibility of deriving and applying two-valued system of logic in Africa. The reason is that he sees two-valued logic as strictly Western by origin and application. He runs into contradiction with the idea that ‘wherever a thing stands, what it is not stands with it’ since he sees African three-valued logic as a logic system that can stand alone in Africa. In this way he is absolutizing African three-valued logic to Africa and that outside this system no other system of logic can be derived from, and applied to, Africa. Hence, he runs into the problem of absolutism which he claims the assertion denies. I call this **Ijiomah’s dilemma 1**. This dilemma is that *in seeking to avoid the absolutization of Western two-valued logic, Ijiomah*

absolutized African three-valued logic in a relative sense. This is apparent in his argument that it is the only operational logic system in Africa.

Also, the argument of Ijiomah that African three-valued logic is the only existing logic system in Africa is in contradiction to the principle of “coexistence of opposing realities” (1996, 45). If opposing realities coexist within a whole, it is expected that opposing logic systems should coexist within a culture. This is not the argument of Ijiomah. His view is that every culture has its own logic. So, African three-valued logic does not coexist with other logic systems. It exists alone. This implies that it is an *ego solus* logic. This is **Ijiomah’s dilemma 2**. This dilemma holds that *while Ijiomah promotes an ontology that sees realities as entities which co-exist with one another, he sees African three-valued logic as that which exists alone in Africa.* Ijiomah’s notion of logic falls into the same problem of reductionism, which his ontology tries to avoid. In his ontology he opines like Engel that “extremes meet” (Engel 1974, 50) in opposition to the Hegelian and Marxian subsumptive monism (1996, 47). In this subsumptive monism, all realities are reduced into one, either spirit or matter. For Ijiomah, “opposites are always harmoniously in monism” (1996, 47). This is not what Ijiomah translates in the question of logic in Africa. He sees opposing logic as contradictory and reductionist monism.

Furthermore, the idea that Ijiomah’s African three-valued logic is the only logic system in Africa is not in tune with his idea that African three-valued logic complements Western two-valued logic. It should be noted that Ijiomah’s notion of complementarity is one that sees African three-valued logic as complementing Western two-valued logic in a mutually exclusive sense. It is in a mutually exclusive sense since African three-valued logic is used to explain African conception of reality and Western two-valued logic is employed to explain Western conception of reality. This is far from the complementarity that Ijiomah advanced about reality. He holds that opposing realities complement each other within a

whole. This is complementarity in a mutually inclusive sense. This takes us to **Ijiomah's dilemma 3**, which reads: *although Ijiomah promotes an ontology that is mutually inclusive, he however advanced a logic system that is mutually exclusive [African three-valued logic complements Western two-valued logic in a mutually exclusive sense]*. This is why, for him, African three-valued logic operates only in Africa in exclusion of Western two-valued logic. This contradicts his idea that every reality complement and is being complemented by other realities.

A fourth dilemma can be deduced from Ijiomah's idea of missing link. Ijiomah notes that X is a missing link to $\neg X$ as well as $\neg X$ is its [X] missing link within a whole (An Excavation 32). It is even in this light that he considers the third value of his African three-valued logic as consisting of T and F as missing links. One expects Ijiomah to translate this thinking into his logic, but he did not. His view is that African three-valued logic has no other system of logic that serves as missing link to it in Africa hence, **Ijiomah's dilemma 4**. This dilemma is that *Ijiomah advanced a logic that is not serving as a missing link to other logic systems in Africa contrary to his idea of missing link*. These are the dilemma that are inherent in Ijiomah's 'Harmonious Monism' that need to be addressed shortly.

It should be noted that all these dilemmas were not intentionally generated by Ijiomah. He came about them due to the mindset that influenced and informed his philosophy. Ijiomah's mindset is relativist and the logic system that he developed is nothing but reflecting it. Ijiomah's logic system is due to his zeal for Logical Relativism. This system of thought advocates a thinking that African three-valued logic is peculiarly African, but it fails to take into cognizance that it is possible to have more than one system of logic within Africa. This makes Ijiomah a Logical Relativist'. Hence, one can argue that the ontology that shapes and influences Ijiomah's three-valued logic can help to transform these dilemmas into a better logical thinking. Inherent in this Ijiomah's thought are: the principles of non-

absolutization of any entity or reality, the principle of coexistence of realities, the principle of complementarity, and the principle of missing link. From these four principles, it can be argued that no logic system can and should be absolutized in Africa. Thus, all logic systems can coexist, complement and serve as missing links to each other in the explanation of reality within Africa. Therefore, African logic should not be restricted to the three-valued system of logic. Rather, it should also include other systems of logic such as one-valued logic, two-valued logic, etc.

Conclusion

The argument canvassed in this article upholds that African logic as three-valued logic has a structure that is in congruence with African ontology that presents reality as trivalent. There is therefore an actual trivalent conception of reality as ‘spirit’, ‘matter’ and, ‘spirit and matter’. It is this conception of reality that has brought about African three-valued logic, wherein there is ‘true’, ‘false’ and, ‘true and false’ as its three mathematical values. This is in accordance with the view that the structure of a logic system takes the form of the nature of the reality it studies.

In like manner, it has been argued that African three-valued logic is not the only system of logic in Africa as Ijiomah claims. African three-valued logic co-exists, complements and serves as missing link with other systems of logic such as two-valued logic, one-valued logic etc. So, it is possible for other systems of logic, outside three-valued logic, to be deduced and applied within Africa. Moreover, African three-valued logic and its three principles are not derived from Aristotle’s bivalent logic and its principles. Thus, instead of asserting that the three principles of African logic were derived by relaxing the three laws of bivalent logic, the article avers that the three principles of African logic are deduced or deducible from African conception of reality. To accept the other way round is to absolutize Aristotle’s bivalent logic and its laws of thought as Chimakonam has done. In sum, African

logic as three-valued logic is an undisputable reality. Yet, it is a logic that leaves room for the development of other systems of logic alongside their undergirding principles, from African culture.

Works Cited

- Anyanwu, K. C. 1987. "Ultimate Reality in Igbo Cultural Experience". *Ultimate Reality and Meaning*. 7: 84-101.
- . 2000. "The Problem of Method in African Philosophy." *The Substance of African Philosophy*, 57-73. Ed. C. S. Momoh, Auch: African Philosophy Project Publications.
- Animalu, A. O. E. and J. O. Chimakonam. 2012. "4x4 Magic Square Representation of Complementary Duality of African thought Logic". *African Journal of Physics*. 5: 141-168.
- Apebende, S. A. 2016. "Our Worldview Our Logic: A Case against Absolutization of Classical Logic". *The Oracle: International Journal of Culture, Religion and Society*. 3: 78-93.
- Asouzu, Innocent I. *Ibuanyidanda (Complementary Reflection) and Some Basic Problems in Africa*. Zurich: Lit Verlag GmbH and Co. KG Wien, 2013.
- Chimakonam, J. O. 2014. "Ezumezu (African) Logic as an Algorithm for Scientific Research in Africa". *Philosophy, Science and Human Development: International Conference Papers 2011*, 58-77. Ogboso, C. N. and Asogwa, C. I. eds. Enugu: Snaap Press.
- _____. 2013. "Quantification in African Logic". *Filosofia Theoretica: Journal of African Philosophy, Culture and Religion*. 2 .2: 409-422.
- _____. 2011. "Why Can't There Be an African Logic? *Journal of Integrative Humanism*, 1.2:141-152.
- Edeh, E. M. P. 1985. *Towards an Igbo Metaphysics*. Chicago: Loyol University.
- Engels, F. 1974. *Dialectics of Nature*. Moscow: Progress.

- Etim, C. 2015. "African Logic". *Argument and Evidence: A Multi-Disciplinary Approach*, 126-139. Eds. Udo Etuk and Chris Ijiomah. Uyo: Inela.
- Etuk, U. 2002. "The Possibility of African Logic." *The Third Way in African Philosophy: Essays in Honour of Kwasi Wiredu*, 98-116. Ed. Olusegun Oladipo. Ibadan: Hope Publications.
- Hebga, M. 1958. "Logic in Africa". *Philosophy Today*, 4.4:222-229.
- Horton, R. 1977. "African Traditional Thought and Emerging African Philosophy Department". *Second Order*. VII. 1.
- Ijiomah, C. O. 2006. "An Excavation of Logic in African Worldview". *African Journal of Religion, Culture and Society*. 1.1:29-35.
- _____. 2005. "Some Epistemological Tools with which Africans Relate with Realities". *Time, Reality and Meaning*. 4:75-87.
- _____. 2000. "In Praise of Many Value Logic". *Sapientia-Journal of Philosophy*. 1.1:141-151.
- _____. 1996. *Contemporary Views about Philosophy of Education*. Calabar: Uprico Press.
- Iroegbu, P. 2002. *Beyond Materialism and Spiritualism*, Ibadan: Hope Publications.
- _____. 1995. *Metaphysics: the Kpim of Philosophy*. Owerri: International Universities.
- Mahay, G. 1981. "The Law of Excluded Middle and Many-valued Logic. *Indian Philosophical Quarterly*. 9.1:7-15.
- Momoh, C. S. 2001. "Psychological Logic and Mood Symbol". *Philosophical Psychology: Selected Readings*, 132-153. Ed. Godwin Azenabor. Lagos: Malthouse.
- _____. 2000. "The Logic Question in African Philosophy." *The Substance of African Philosophy*, 175-192. Ed. C. S. Momoh, Auchi: African Philosophy Project Publications.

- Nweke, V. C. A. 2012. "African Logic: A Complementary Reflection on the Condition for its Existence and Non-Existence". *Flash: Journal of Philosophy and Religion*. 6. 1: 49-71.
- _____. 2014. "From African Logic to the Development of Traditions of Logic in African Philosophy: An Integrativist's Perspective". *Journal of Integrative Humanism Ghana*. 4.1: 22-39.
- Ogbonnaya, L. U. 2017. "An Appraisal of the Ontological Foundation of African Logic from the Perspective of Asouzu's *Ibuanyidanda* Ontology". A Ph.D. Dissertation Proposal, University of Calabar, Calabar. 2017.
- Okankan, C. E. "African Logic". etinosaokankan.blogspot.com. web. 02.04.2017.
- Okoro, C. M. 2008. "An Appraisal of African Concept of Being". *Philosophy and Praxis: Journal of Nigerian Philosophical Association*. 4: 30-53.
- Onunwa, U. 2005. *Tradition, Culture and Underdevelopment of Africa*. Suffolk: Arima.
- Ruch, E. A. 1977. *The Ways of Knowing and Thinking*, Roma: University of Lesotho Press.
- Uduma, Oji U. 2015. *Beyond Irredentism and Jingoism: Reflections on the Nature of Logic and the Quest for (an) African Logic*, Abakaliki: Ebonyi State University 7th Inaugural Lecture.
- _____. 2004. *Modern Symbolic Logic*, Enugu: Pan-African Publishers.
- Umeogu, B. 2012. *Symbolismic Logic: Towards a New Universe of Knowledge, a New Logic and a New African Philosophy*, Enugu: Victojo Production Services.
- _____. 1996. *Principia Logica: A Most Complete Handbook of Logic(s)*, Onitsha: Midfield Publishers.
- Unah, J. 2009. "Ontologico – Epistemological Background to Authentic African Socio Economic and Political Institutions" *From Footmarks to Landmarks on African Philosophy*, 264–278. A F. Uduigwomen (ed) 2nd ed. Lagos: O. O. P.