Numerical Symbols as Paradigm of Intracultural Trace Element of Relationship in Between *Ifá* and *Ayò-Ọlọ́pọ́n* among the Yoruba of South-West in Nigeria: A Comparative Symbolic Analysis

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Abstract

Ifá, the deity of wisdom and divination, and *ayò-ọlọ́pọ́n*- indigenous board game are indigenous Yoruba cultural elements with international nomenclatures. However, despite the global cultural recognition of *Ifá and ayò ọlọ́pọ́n*, no research is known to the author that either accounts for the symbolism of *ayò ọlọ́pọ́n* numerology or relate *If*á numerology to *ayò ọlọ́pọ́n*. Therefore, the objective of the study is to establish *Ifa* and *ayò-ọlọ́pọ́n* memes. The study makes use of literary texts, *Ifá* literary corpus, and *ayò ọlọ́pọ́n* texts and the author's observation and analyzed with symbolism, a semiotic mode, where a symbol represents something, or somebody in one or more capacities is adopted because Ifá system operates around symbolism. It is found that there are nexus numbers around geometric progression and indices in ratios 4 and 5, in between *ayò ọlọ́pọ́n* and *If*á training numerology around pre-initiation, initiation, and post-initiation stages, Yoruba divinities, and calendars. The study concludes that *ayò ọlọ́pọ́n* and *If*á numerology are memes.

Keywords: cultural element, indigenous board game, memes, numerology, symbolism

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Introduction

This work examines the relationship In numerical symbols between *Ifá,* the compendium of Yoruba culture, and *ayò-ọlọ́pọ́n*, a Yorùbá indigenous board game played locally and internationally. *Ifá* is indeed regarded as the bedrock of other aspects of Yorùbá life. This opinion implies that all elements of other cultural activities of the Yoruba are related in one way or the other with *If*á. However, despite the prominence of *ayò-ọlọ́pọ́n* among the Yoruba and in the diasporas, no work is known to have related *ayò-ọlọ́pọ́n* to *Ifá* numerology. *Ayò-ọlọ́pọ́n* is "one of the oldest local games among the Yorùbá and has been in existence since time immemorial" (Faturoti 2015: 1). As a result of the immemorial historical existence period of *ayò-ọlọ́pọ́n* that falls around the prehistoric era, some of the cultural significance of numbers around the game remain latent till today.

Ifa's scope of knowledge is enormous. Akíntọ́lá (1999) sees *Ifá* as the philosophy of or wisdom divinely revealed to the Yorùbá deity of *Ifá*, *Ọ̀rúnmìlà*. He explores *Ifá* philosophical knowledge as a philosophy of life rather than science. *Ifá* is described as the spokesperson not only for the gods but also for the living and is regarded as the bedrock of Yorùbá culture (Abímbọ́lá, 1977a). This opinion posits that no aspect of the cultural life of the Yoruba is not encapsulated in *Ifá*- history, philosophy and religion, economic and Yoruba political system, mythologies and histories, science and technology, among others. All of these scopes of knowledge are categorized into two general forms: science and religion (Yemitan & Ògúndélé, 1970). That is, *Ifá's* knowledge can be summed into these two forms. All the scopes of *Ifá's* knowledge listed earlier can be categorized into science or religion.

Based on the scientific and religious knowledge of *If*á, different intellectual works on *Ifá* are premised on this science and religion. On the scientific aspect with which this study is closely related, Àjàyí (1990) adopts a binary mathematical system about Ifá knowledge. He concludes that the Ifá binary system is basic to the binary model in mathematics. Lóngẹ́ expanded further on the links between computer science and what is known as '*If*á Divination' knowledge. His study covers binary digits,

numerical values in *If*á, modular arithmetic, modular two arithmetic, permutation, and coding. The study establishes that "Ifá Divination, as an ancient Yorùbá knowledge system, reveals to us the coherence, logicality, precision, and profundity of the thoughts, philosophy, mathematics, and computer science as known and practiced by our forefathers (and mothers) before the 11th Century A. D. well before the same ideas were rediscovered in the West in later centuries" (Lóńgẹ́, 1983, p. 41). Lóńgẹ́ essentially states that there is an inherent scientific knowledge of *If*á as African scientific knowledge that pre-date more recent scientific and technological developments. African science is often used to develop and position 'modern' science today. The potency of indigenous science is evidenced by the sustenance of indigenous African knowledge that still thrives in the face of "imported or foreign knowledge."

Similar to the work of Lóńgẹ́ is the work of McGEE (1983) that demonstrates some mathematical principles in *If*á. In his work, he relates the visitations of *od*ù with each other to the surface of the earth, the dual nature of *od*ù, and the divisibility of *od*ù with even numbers using mathematical formulae. Various findings by different scholars affirm that, without the indigenous scientific knowledge of the past, the present or modern science will be baseless or have no foundation to rest on. The previous finding affirms that "our remote ancestors scaled great heights in science, arts, and technology. They had unparalleled human imagination entailing idealization and synthesis action of both the material and extra-material worlds" (Ogundele, 2021, p. 19)

As *Ifá* is described concerning science and religion, *ayò-ọlópọ́n* is a recreational activity closely associated with the Yoruba. Such a recreational activity "denotes the mental excellence of the people" (Roy, 2003, p. 657). The implication of this opinion on *ayò-ọlópọ́n* demonstrates that the socio-cultural activity associated with the game is associated with Yoruba peoples' ways of life. Therefore, a study of this nature is important.[1] It is believed to account for the crisscrossing of the relationship between various Yoruba cultural elements. The implication of this relationship posits that there is likely to be social, scientific, and

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[1] *Ifa's* scientific and religious knowledge with *ay*ò that is a social activity.

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religious interrelation in-between the two cultural elements- *Ifá and ayò-ọlópọ́n*.

Scholars in the areas of sociology and anthropology of Yorùbá have written about Yorùbá traditional games. Kọ́mọláfẹ́ (1978) estimates there are over twenty Yorùbá traditional games. He categorized them into four: indoor games, outdoor games, children's games, and adult games. It is a game that has more materials than the other games (Aromọlaran & Mustapha, 1976). *Ayò-ọlópọ́n* is the only Yorùbá game that has international recognition; it is also the game that has the most standardized rules. This could be a result of the connection being perceived the game has with *Ifá* being perceived by this study.

Oyeleke et al. have established some values of *ayò-ọlópọ́n* to be: a cure for dementia, hypertension, and poor sight. Because of this development, their study proposes that *ayò-ọlópọ́n* be invented or developed on social media to make it accessible to people. This proposal implies that "sufferers will once again have the feel of their culture on mobile platforms…Its acceptability by demented people and potential sufferers will not be an issue…These attributes we believe will help African sufferers to recover faster" (2014: 25). Again, *ayò-ọlópọ́n* as one of the indigenous scientific knowledge is discovered to be recognized for sustainable societal development.

The opinions of scholars on *the ayò* system suggest that, in addition to the social knowledge it centrally manifests, its scientific knowledge is likewise not in doubt. The implication is that any cultural activity associated with numbers involves scientific knowledge to understand the system. Scientific knowledge cannot be adequately explored without mathematical theories and principles such as geometric progression and indices being used to establish links in *Ifá and ayò-ọlópọ́n* numerology in this study. That is, even though *ayò-ọlópọ́n* is generally believed to be a recreation majorly for entertainment, a proper understanding of *ayò-ọlópọ́n* cannot be devoid of scientific knowledge as "games are related to mathematics" (Nleya & Ndlovu, 2020, p. 138). Ineptitude in focusing on the scientific knowledge of *ayò* has made the number of game activities meaningless as no cultural importance or symbolism has been associated with them, as earlier pointed out.

Scholars such as Ládélé et al. (1986), Dáramọ́lá and Jéjé (1967), and Mustapha and Arómọláran (1976) worked on the principles governing *ayò-ọlọ́pọ́n.* Some principles have been related to *If*á, such as line tracing, cultural binary, and anticlockwise movement (Orogbade, 2017). The work of Abiọdun focuses on the language used within the context of the ayò game. He concludes that acceptability or non-acceptability of utterances depends on the context or situation, noting that "violation of sociolinguistic restraints, which in normal usage of the language would be frowned at, is found to be quite acceptable in the context of the game of *ay*ò" (1998: 43). Some of the information and utterances during the process of *If*á divination have been addressed by (Orogbade, 2017). For example, neither *Ifá* priest nor *ayò-ọlọ́pọ́n* players can be liable for any offense committed during the process of *If*á divination and *ayò-ọlọ́pọ́n.* Privileged information is freely released without any fear or molestation. The identified links between *Ifá and ayò-ọlọ́pọ́n* emphasize the fact that adventures into the numerology of *Ifá and ayò-ọlọ́pọ́n* are a tilling ground that worth investigation as undertaken by this study.

Materials and Methods

In *If*á divination, two divination objects are mostly used by *If*á priests- *ọ̀pẹ̀lẹ̀*[2] An *ikin.*[3] In divination by *ikin*, the *Ifá* priest puts the sixteen sacred palm nuts in his palms and attempts to take the palm nuts with the second palm, "if one palm-nut is left in his hand, he makes two marks on the yellow powder of divination, but, if two palm-nuts are left in his hand, he makes one mark. If none of the palm nuts is left, he makes no marks. This process is repeated until an *Od*ù signature is obtained" (Abímbọ́lá, 1976, p. 11). *Ọ̀pẹ̀lẹ̀* system of divination makes use of *ọpẹ̀lẹ̀* seeds that have two lobes: rough and smooth surfaces. Eight *ọ̀pẹ̀lẹ̀* seeds are tied together with a chain, sometimes by beads. The chain is held in the middle

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[2] *If*á divination chain with eight *ọ̀pẹ̀lẹ̀* seeds tied to it.
[3] The *If*á sacred palm nuts

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and cast forward.[4] In such a way, four seeds fall by the right hand and four by the left hand, through which the symbol is read and interpreted. In either case, whether *ikin* or *ọpẹ̀lẹ̀* is used, the *Odù* that manifests through the divination object is what is in this study important; because such *Odù* is expressed in the symbol by which numbers are involved.

Ifá symbols are marked by stroke- marking of *Odù* is strictly based on the line on the divination 'arena.' The marking, identification, reading, and interpretation are based on lines on the divination board. This process brings about *Odù* symbols with which the writings on the lines are identified. *Ifá's* divination system employs a wooden board with symbols marked or inscribed with a powder. The diviner then traces lines in the powder to interpret the message. However, the identification, marking, and interpretation of the symbols is spiritual- strictly carried out by an initiated *Ifá* priest. In this process, "the lines allow for the connectivity between the physical and the human world" (Salamone, 2012, p. 3). The lines or strokes is also important in *ayò* game; as "some traditional games like the Yorùbá *ayò* involve some writing in the form of strokes or lines" (Na' (Allah 2010: 4). This has earlier been identified in this study as one of the nexus between *Ifá and ayò-ọlópọ́n*

Ayò-ọlópọ́n is played on the traditional game board containing twelve holes on two horizontal lines.[5] It is played so that the players sit directly opposite each other with the game board at the center, mostly in the open place. The game starts after each of the twelve holes is occupied by four *ayò* seeds, totaling forty-eight *ayò* seeds.

The *ayò* game starts with a player taking the four *ayò* seeds in any hole on the row of the player's game board. Then, *Ayò* seeds are distributed in an anticlockwise movement.[6] in the next four holes. This is known as sowing. Then, the game continues, each player employing different strategies to win more seeds. However, there are standard rules guiding the play of *ayò*, among which are- none of the holes must be

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[4] This has a specialized and trained form of performance.

[5] Six holes by the right and left sides of the players.

[6] The anticlockwise movement in the performance of *ayò-ọlópọ́n* has earlier been pointed out in this study as one of the connecting features of *ayò-ọlópọ́n* and *Ifá*

skipped when sowing, both players must be transparent, and harvesting can only be obtained by two or three *ayò* seeds in a hole. This is known as "harvesting" or "capturing."

The winner is determined by the player having more *ayò* seeds than the opponent. A player with more than twenty-four *ayò* seeds emerges as a winner since the total number of *ayò* seeds on the game board is forty-eight. After that, the two players can play in a draw. In this case, no winner emerges. This is traditionally described as *òmì* (draw game). The game continues until a winner emerges twice. If a loser of *the ayò* game is defeated more than twice, he gives way for another *ayò* player to display his competence with the winner. However, this rule is not rigid, as the players may continue after a player is defeated twice if there is no interested player to continue the game. Although ayò can be played without spectators, the game becomes more interesting when it attracts spectators. Likewise, there is no constraint on age or sex in the game. However, the skills associated with the game, particularly a good knowledge of numbers, means it is associated with cognitive development, which invariably cannot be devoid of age.

Semiotics, adopted for this study, can be traced to the pioneering works of Charles Sanders Peirce, the American philosopher, and Ferdinand de Saussure, the Swiss Linguist. Semiology is the study of signs as part of social life. He focuses on the functions of a social and cultural phenomenon within a semiotic system (Saussure, 1974). Saussure classifies signs into two entities: "signified and or sign-vehicle or meaning" (1974: 60), referring to the signified as forms of materials (objects, images, sounds, and others). Saussure is credited with the structuralism approach, which, to him, language is formed by signs that are related in multiple ways. A sign, symbol, or word, including a number, consists of two parts: one part is its form, and the other part is its meaning. Conventions of language users fix the connections between the form and meaning of a sign. This can be related to numbers in *ayò-ọlọ́pọ́n* as forms of signs; their meanings need to be fixed; as meaning, which is the second entity of sign, is presently missing in the social activity of the Yoruba.

Unlike Saussure, Peirce believes that icons, symbols, indexes, and code should be sufficient modes to describe any significant form within

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semiotics' purview. The three modes are, however, interwoven such that a sign can be described as an iconic symbol, indexical symbol, or symbolic icon depending on dominating features of signs in a context. The symbolic mode has to do with a situation (in the context of this study) whereby numbers in *Ifá* stand for something conventionally established within the Yoruba culture and belief. The perceived symbolic number relation between *Ifá* and ayò is an attempt to trace and establish symbolisms of *ayò-ọlọpọn* numerology.

Semiotics, as a science of signs, is apt to unveil numerical symbolisms of *ayò-ọlọpọn concerning Ifá.*[7] Because the scope of semiotics is all-encompassing to accommodate all aspects of knowledge, some authors see the scope of semiotics as the science of signs and human beings and living organisms. In the opinions of Petrilli and Ponzio, "we have two meanings of 'semiotics': semiotics as a discipline or general science of signs and semiotics as specifically human semiosis" (2007: 3). It is believed that scientific knowledge as a scope in semiotics is capable of unveiling meaning relation in-between *Ifá and ayò-ọlọpọn* numerology since "symbolism underlies Ifá divination" (Ọlátúnjí, 2005, p. 135).

In symbol mode, unlike in iconic mode, there is no resemblance or connection between the signifier and the signified. That is, the object or somebody as signifier and what it or S/he stands for as the signified. A symbol's connection with its object is a matter of convention, rule, or agreement between the users. Such symbols, rules, and conventions must be learned between the signifier and the signified. For example, the symbolic *Ifá and ayò-ọlọpọn* numbers stand for or represent something or somebody within the cultural milieu or belief of Yoruba people. The such symbolic representation must be culturally established.

In the contexts of *Ifá* and ayò, meanings associated with numbers explain their cultural values or significance around the belief system. Such meaning number relations are not limited to one but multiple

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[7] Scientific methods can only comprehend some aspects of *Ifá's* scope of knowledge. See Yemiitan and Ogundele (1973: ix). Because of the scientific nature of this study, mathematical rules of arithmetic progression, and indexing, each succeeding term is produced by multiplying each preceding term by a common ration. The common ratio in *Ifá* is to be related to *the ayò-ọlọpọn* system to account for their synergies.

meanings. The meanings may be influenced by the context of use or as a variation- an extension of the use of numbers within the culture (Kennedy & Gioia, 2007). Symbols in the form of objects and numbers are information carriers that need to be interpreted in line with cultural essence or context.[8] Different meanings to a symbol or number make a symbol the be learnable. There must be a convention (in culture) or among the users concerning the symbol's meaning (as earlier explained).

It is a challenge for culture experts, especially in the sociology of culture, Anthropologists, and Archaeologists, to create meanings and cultural values through logical and critical investigation or inquiry into some inherited symbols that their systems have yet to be culturally defined presently. Some inherited symbols and material should be analyzed and interpreted within the rubric of past culture "to learn about their successes, failings and challenges" (Ogundele 2021: 4). interpretation of symbol meaning depends on personal knowledge or intelligence. The meaning invented on a symbol, including a number, makes such a symbol important and relevant to 'real life' application. Whether the material is from personal experience, memory, or imagination: what matter is "as long as the user details can semantically function effectively in the narrative" (Pasner 2007: 6). Relatively, cultural meanings to different symbols in *ay*ò are relevant to the cultural values invented on them. This discovery can be made through relationships with other aspects of cultural life, such as *If*á.

Loss of memory regarding information, meaning, and interpretation of cultural activities is prominent among Africans, where literacy needs to be on time. This poses a challenge for culture experts to investigate inherited cultural activities without any historical values in the present time. The ability to account for the cultural roles of inherited symbols, including cultural numbers, demands the rework of past cultural activities by the present. The need for research accounting for cultural

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[8] The challenge of observing symbols and objects as forms of the writing system has been canvassed that symbol is "indeed of the utmost importance because these symbols are in close relation to speech: they are produced within the speech communities and demand interpretation by these communities. They fulfill one of the essential functions of writing: recording information and enabling its retrieval" (Alain, 2009, p. 9).

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implications of some salient information on symbols becomes expedient because "the model of the past governs present practice and, when change does occur, there is a tendency to rework the past to make it appear that past practice has governed present practice" (Peel, 1984, p. 113). In the pre-history era, symbols, including numbers, were forms of communication through which the people's belief was anchored and understood as "symbols transferred our prehistoric ancestors into organized human beings within the context of cultural life and institutions" (Madubuike, 2005, p. 330). The prehistoric era is associated with oral tradition from which *Ifá and ayò-ọlọ́pọ́n* are closely related.

In Africa, where literacy was late, some of the historical facts and materials are evinced through the oral histories of a community. Relevance of such oral history among Tiv of Nigeria is described by Ogundele when he says that "without anthropological approaches involving oral traditional and oral historical surveys, much information about the social organization, economic strategies, technological innovations and security architectures of the Tiv in antiquity, would have remained in the domain of unknowability or obscurity" (2021: 7). Through oral media, various information can be extracted. In some oral media, such as in various kinds of literature like *Ifá* literary texts, various oral genres, and aphorisms like proverbs, ancient numbers in cultural activities are information conveyers or carriers through which their meanings are preserved and disseminated.

In Yoruba cultural activities such as in *ayò-ọlọ́pọ́n*, interplay or permutation of *ayò* seeds are not generally recognized beyond relaxation, fun, and entertainment.[9] The roles of numbers in the game's performance are crucial, as it is impossible to engage in the game without the interplay of *ayò* seeds by the players. Tracing the significance and relationship of cultural symbolisms of *ayò-ọlọ́pọ́n's* numbers to *Ifá* will increase our knowledge of the likely symbolisms of *ayò-ọlọ́pọ́n's* numbers. It is, however, observed in this study that there are inherent latent intra-cultural

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[9] See Daramọla and Jeje (1967: 8). The opinion is influenced by the peoples' orientation about the *ayò* seeds and the game as *eré là á fọmọ ayò ṣe*. That is, we only play with *ayò* seeds.

similarities in-between *Ifá* and *ayò-ọlọ́pọ́n* through which *ayò-ọlọ́pọ́n* numerology can be recreated and described.

The challenge to recreate several activities of the past in present cultural activities, such as undertaken by this study with *ayò-ọlọ́pọn*, had been canvassed by scholars such as Ogundele that "all the facets of African life and living must be recreated on a pragmatic basis" (2021: 18). *Ayò-ọlọ́pọ́n* is a Yoruba indigenous recreational activity with some latent cultural information such as the information being conveyed by *ayò-ọlọ́pọ́n* numbers that remain unknown today. Therefore, this study is aimed to relate *Ifá* numerology to Ifá pre-initiation[10], initiation[11] and post-initiation[12] Symbolisms, Yoruba divinities, and calendar to *ayò-ọlọ́pọ́n* numerology. The study's objectives are to establish numerical links in *ayò* seeds with *Odù.*[13]ù.

In Ifá symbols and to relate the products of the numbers in the ayò game to the projected number of Yoruba divinities and the Yoruba month, week, and yearly calendar.

The symbolism of numbers is described concerning the cultural roles, which are proportional to their values and use. A symbol's value and cultural relevance are eroded or lost when there is a limit to what we think the meaning should be. Kennedy and Gioia aptly say that we will "miss the value of a symbol, however, if we think it can mean absolutely anything we wish" (2007: 238). That is, in the context of this study, different meanings can be determined and established *for ayò-ọlọ́pọ́n* numbers.[14]

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[10] This is several Ifá corpus that must be recited or mastered by the prospective *Ifá* trainee.

[11] *Ifá* training stage, where a training must have possessed a minimum requirement by mastering some numbers of *Ifá* corpus before being initiated into *the Ifá* profession cult.

[12] A projected number of *Ifá* corpus is believed to be mastered by the *Ifá* practitioner to be outstanding in the Ifá profession.

[13] All the corpus of *Ifá* is coded in *Od*

[14] However, cultural facts must support the development of meanings to cultural numbers to account for such symbolic meanings being interpreted.

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Number roles in *Ifá* are related or paired with *ayò-ọlópọ́n* in this study to establish shared features, values, and forms in their numerology.[15] It is observed that "the basic strategy in using a symbol as a cue is to pair something with the thing that it is to cue. Depending on the particular person, if this pairing is done often enough with enough intensity, over a long enough duration, or in an environment free of distraction … the person will come to associate the two things with each other. Such a symbolic association allows one thing to be used as a cue for the other" (Combs & Freedman, 1990, p. 126). The principle of paring is applied to the Ifá training stages numbers as a cue for the establishment of *ayò-ọlópọ́n* numerology. Each perceived *Ifá* number is related to the *ayò-ọlópọ́n* devised number to establish their memes.

Results and Discussion

In other to evince different *Ifá* numerical symbolisms and interpretations coded or implied in *ayò-ọlópọ́n*, there is a need to provide a complete set- of arrangements of *ayò* seeds on the board. An effort is made to give some possible meanings to *ayò* symbols obtained from *Ifá* symbols.[16] This is necessary because a complete set[17] Of *ayò* seeds on the two rows of the game, the board is mandatory before the commencement of the game. Therefore, the grouping of *ayò* seeds into four-four (4-4) twelve holes is the first step to presenting the analysis of establishing a numerical relationship in-between *Ifá and ayò-ọlópọ́n* numerology. The addition of the *ayò* seeds in a row is twenty-four; this makes the whole *ayò*

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[15] By using *Ifá*, the compendium of Yoruba culture and religion as trace *ayò-ọlópọ́n* cultural numbers that have been lost in history. Since *Ifá* numerology is preserved in literature today, establishing similar relationships between the two cultural elements are desirable.

[16] As earlier indicated, semiotic symbols are not limited to a single meaning; but with various possible derived meanings.

[17] A set of *ayò* seeds is forty-eight (48).

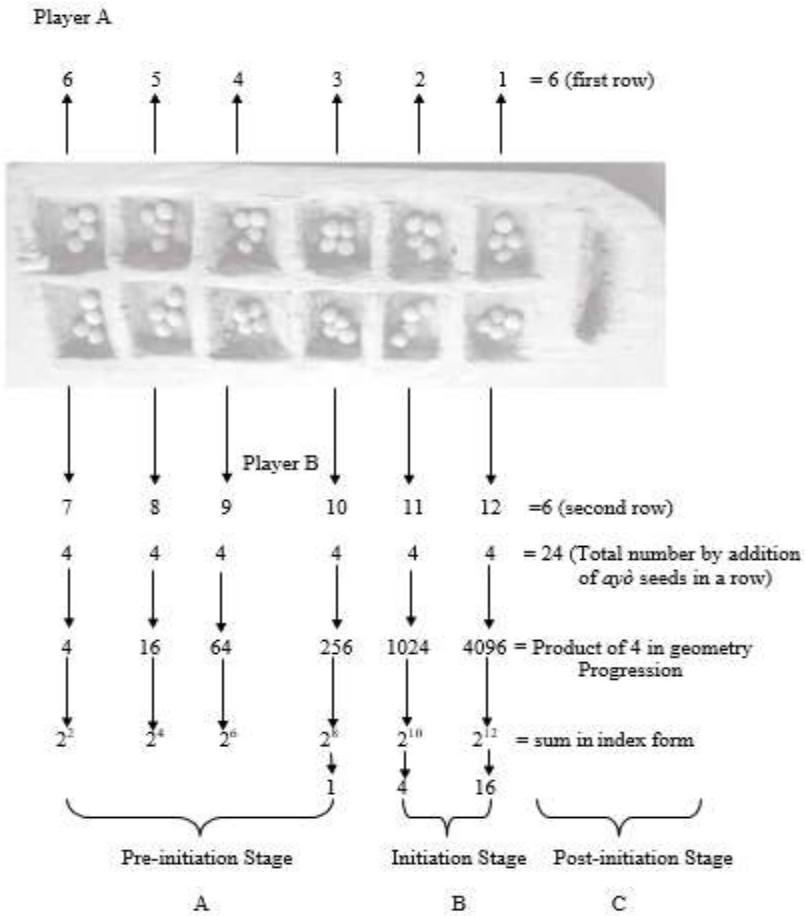seeds on the two rows forty-eight. The complete arrangement is shown with the symbols in figure 1[18]below.

Figure 1. Complete Set of *Ayò* Seeds on the Board concerning *Ifá* Divination Training Numerology

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[18] The researcher provides the diagram to demonstrate the interface in some *od*ù Ifá symbolisms in *ayò-ọlọ́pọ́n*

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The 48 *ayò* seeds must initially be grouped into twelve holes (six holes on each side of the two players). Each hole is occupied with four *ayò* seeds. The total number of *ay*ò seeds in possession of each player is 24.[19] Based on the total number of *ay*ò in a row: 24, the analysis with *Ifá* divination number is based. The structure of *ọpẹ̀lẹ̀* in number is related to the number of *ayò* seeds in a row on the board, such as described by Abimbọla that "if the basic probabilities (i.e., rough versus smooth surface) are represented with number 2, it means that the possible number of presentation on one side of the divining chain is 24" (1976: notes on plate 2). When 24 is duplicated, the sum of 48 is obtained. Relating this arrangement to the Ifá divination system, the grouping of 240 minor *odù in Ifá* is into 12, like in *ayò-ọlópọ́n* where all the 48 *ayò* seeds are likewise grouped into 12. Abímbọ́lá says the 240 minor corpus are arranged in twelve groups known as *Àpólà-* section, "the twelve groups bear the names of the sixteen principal *Odù*" (1976: 27-9).

Looking at the structure of groupings [20] Of *ayo-ọlópọ́n* in picture 1, it is divided into three stages, in line with the three stages in the training of *Ifá* divination.[21] The first stage is the pre-initiation stage, represented by the alphabet A. The second stage is the initiation stage, as indicated with B; while the third stage is the post-initiation stage, marked with C, as indicated in Table 1[22] below:

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[19] Each *ay*ò player possesses this number on a row of the board.

[20] The arrangements of *ayò* seeds on the game board before the commencement of the game are shown in the diagram, and the implications of the grouped *If*á symbols are related to the ayò symbols.

[21] The Ifá divination profession establishes the three stages.

[22] The researcher supplies the table to indicate the earlier diagram of a complete set of ayò seeds on the board game concerning some *Od*ù-Ifá professional training symbols

Table 1. Geometric Progression and Index in *Ayò-ọlọ́pọ́n* concerning *Ifá* Pre-initiation, Initiation, and Post-Initiation Stages.

s/n	Pre-initiation stage	Initiation stage	Post-initiation stage
I	2^2 (4)	2^{10} (1024)	2^{12} (4096+)
Ii	2^4 (16)	2^{12} (4096)	
Iii	2^6 (64)		
Iv	2^8 (256)		
	The first stage (A)	The second stage (B)	Third stage (C)

Table 1 above presents stages in *If*á training. These stages are related *to ayò-ọlọ́pọ́n* as indicated in figure 1. By looking at picture 1 and Table 1, it can be observed that 4 is the common ratio of stages in *ayò-ọlọ́pọ́n* numerology. Ratio 4 calculates the geometric progression and indices as indicated above. Sequential analysis of the numerical nexus of the *Ifá* training symbols- pre-initiation, initiation, and post-initiation stages in *the ayò-ọlọ́pọ́n* system are indicated and analyzed below:

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2^2 (4): Symbolizes four (4) *ayò* seeds in a hole. Each of the twelve *ay*ò holes must be occupied by four *ay*ò seeds before the game commences. In *Ifá* divination, it symbolizes the number of *ẹsẹ-ifá* mastered by the *Ifá* trainee. "*Od*ù has quadruplet nature" (McGEE 1983).
2^4 (16): Symbolizes sixteen (16) *ayò* seeds in two (2) holes: 4 x 4 = 16. This symbolizes four *ay*ò seeds taken by each player in a hole. In *Ifá* divination, it symbolizes a prospective *Ifá* priest has mastered a total number of sixteen (16) *ẹsẹ-Ifá*. That is, "the Principal or Original Odu are said to be of divine origin and to be the earthly counterparts of heavenly deities" (McGEE (1983: 110). 2^6 (64): Symbolizes sixty-four (64) *ayò* seeds in three (3) holes: 4 x 4 x 4 = 64. In *If*á, this number is "the product of the quadruplet nature of the Odu with the 16 Principal Odu. It follows that 4 x 16 = 2^6" (McGEE, 1983, p. 101). Therefore, this number symbolizes that an *Ifá* trainee that has masters sixty-four (64) *ẹsẹ-Ifá* verses.

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2^8 (256): Symbolizes two hundred and fifty-six (256) *ayò* seeds in four (4) holes, which are the products of four (4) holes on the game board, that is, 4 x 4 x 4 x 4 = 256. In *If*á divination, this symbolizes the proficiency of the *Ifá* trainee in two hundred and fifty-six *ẹsẹ-ifá*. This marks the first stage in *Ifá* divination, known as pre-*Ifa*-divination.[23] The pre-initiation stage requires that an *Ifá* trainee knows off-hand one verse from each 256 *Odù*, which symbolizes a basic knowledge of becoming *two Ifá*. At this stage, "pre-initiation training marked by the completion of the *If*á trainee's course in the manipulation of the divination chain, and the stage is called 'ṣí-ṣí Ọ̀pẹ̀lẹ̀ já.' *Ọ̀pẹ̀lẹ̀* comprises of eight 2^8 =256" (Akíntọ́lá 1999: 13).

To calculate the geometric progression (G.P),   the nth term[24] of the sequence is given by:

$$a_n = ar^{n-1}$$

Therefore, the G.P. is to find the fourth term.[25], using the formula ar^{n-1}

    a = 4
    r = 4
    n = (4th term)

Therefore $a^{n-1} = 4(4)^{4-1} = 4(4)^3 = 4(64) = 256$: pre-Ifá initiation number as numerically coded in *ayò-ọlópọ́n*. Looking at the picture showing the distribution of *ayò* seeds, the fourth term is 256- indicated by 1: the pre-initiation stage in *Ifá.* 256 is the signifier of the signified: pre-initiation stage as indicated in *the ayò* system. Each of 4, 16, 64, 256, 1024, 4096…can be analyzed with pre-Ifá divination above.

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[23] Even though *ayò-ọlópọ́n* is not a profession; however, it has to do with specialized knowledge to be proficient, and those suggested in numerical links between *ayò-ọlópọ́n* and *If*á in this study point to some similarities between the two cultural elements.

[24] Symbolizing any number of 4, 16, 64, 256, 1024, 4096…

[25] See the complete set of *ayò-ọlópọ́n* on the board as indicated with the fourth number with the pre-Ifá initiation number.

Initiation Stage of *Ifá* Divination and *Ayò-ọlọ́pọ́n's* Memes

The second stage involves *Ifá* training requirements: basic and standard. This stage in *Ifá* training implies that one out of the requirements must be met for an *Ifá* trainee to be initiated into the cult of *Ifá- awo Ifá*. At the initiation stage, the trainee can practice *Ifá* divination as a profession, provided the trainee has mastered the numbers of *ẹsẹ-Ifá- Ifá* versus required. Sequential number specifications in *Ifá* are indicated and related to the derived *ayò-ọlọ́pọ́n* counterpart. The required numbers of *ẹsẹ-Ifá* and their derived symbolisms in *the ayò* game at the initiation stage are given in this study:

2^{10} (1024): Symbolizes One Thousand and twenty-four (1024) *ayò* seeds, which is the product of five (5) holes of sets of *ayò* seeds on the game board.[26] In *Ifá* divination, it symbolizes a stage where the *Ifá* trainee is versed in One Thousand and Twenty-four (1024) verses of *ẹsẹ-Ifá*; at this stage, the minimum qualification for the Ifá trainee's initiation has been met.[27]

2^{12} (4096): This symbolizes Four Thousand and ninety-six (4096) *ayò* seeds, which is a product of a row, that is, six (6) *ayò* holes.[28] This means that an *Ifá* trainee is proficient in Four Thousand and ninety-six (4096) *ẹsẹ-Ifá* corpora. Therefore, the standard requirement has been met at this stage for initiation into *awo Ifá- Ifá* cult. Therefore, the trainee can be called *babaláwo-* an *Ifá* priest or a diviner.

Awo connotes a membership of a cult- professional group. In Yoruba belief, "each professional discipline has a prefix of *awo* which requires means a specialized training involving a gradual and a graduated system of acquisition of knowledge whereby one only proceeds to the next step once one has mastered the preceding steps. Only initiated apprentices are allowed into the guild to acquire the specialized knowledge associated with the training. Moreover, no one is given liberty

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[26] See the first requirement of the initiation stage in picture 1 on the set of *ayò* seeds on the board.

[27] See the initiation stage in Table 1.

[28] See the indicted second stage of *Ifá* divination in *ayò* in picture 1.

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to practice the acquired art until the final step is mastered" (Ilésanmí 2004: 9). Numbers 2^{10} (1024) and 2^{12} (4096) are among "the various numbers of Odu claimed by different writers and Ifá priests" (McGEE, 1983, p. 111). That is, these figures mark the minimum and standard numbers of *ẹṣẹ-Ifá* to be mastered by the prospective *Ifá* priest before initiation.

     Ifá prescribes that the proficiency of *Ifá* trainee's initiation can be marked with *Ọ̀bàrà* corpus.[29] Adéoyè (1985) reports that, *Ọ̀rúnmìlà* decended with *Ọ̀bàrà Ọ̀kànràn* corpus.[30] This probably suggests why the corpus is significant to *Ifá's* initiation process. The corpus is described as: "Ọ̀bàrà kahin kahin awo ilé Ọ̀rúnmìlà" (Salami 2002: 363). That is, *Ọ̀bàrà* corpus is difficult to interpret. Sàlámì asserts that, *Ọ̀bàrà Ọ̀kànràn* corpus marks *Ifá* proficiency.

> *Bí Babaláwo bá gbọ́fá/*If a Babalawo is learned
> *bí ò bá gbọ́fá/*or not learned in Ifá
> *Ẹ jẹ́ á fỌ̀bàrà Ọ̀kànràn lọ̀ ọ́ wò/*Let us test him with Ọ̀bàrà

Ọ̀kànràn

> *Ọ̀bàrà Ọ̀kànràn ló tutù/* Ọ̀bàrà Ọ̀kànràn is the one that is

so cold

> *Ló tutù ló sì ju nini lọ/*Even colder than grasses with

morning dews

>   (2002: 365 in author's translation).

The nature of *Odù* described above is "cold": "Ọ̀bàrà Ọ̀kànràn ló tutù ló sì ju nini lọ" (2002: 365). That is, *Ọ̀bàrà Ọ̀kànràn* is the very cold one, even colder than grasses with dews.

    This study relates *Ọ̀bàrà c*orpus to *ay*ò symbols as the symbol that marks the beginning of *the Ifá* initiation stage. The rigorous training and the spirit of perseverance involved in *Ifá*. This is encapsulated in *Ifá* epistle that:

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[29] This means *Ọ̀bàr*à corpus

[30] The divinities are believed to have descended to the earth's surface as messengers or servants of God- the Yoruba *Olódùmarè* (Adeoye, 1985). This informs why none of the divinities has the history of parents- father or mother. They are only related to themselves and not to human beings.

> *A ní nwọn ó dúró kọ̣'fá, nwọn ò dúró kọ̣'fá /*They were told to endure the training
>> of *Ifá*, they did not stay to learn *Ifá.*
> *A ní nwọn ó dúró mọ ìbò ó gbà, Nwọn ò dúró mọ ìbò ó gbà/*They were told stay to receive *Ifá* lots gifts, they could not stay to receive lots gifts...
> *Ọ̀bàràkànràn l'a dà sílẹ̀ tí wọn ńwò tiiri, wò tiiri!/*This is *Ọ̀bà-Ọ̀kàràn* on the divination tray that is uninterpretable to them.

(Fabunmi 1972: 50).

The corpus above demonstrates how many undetermined trainees of *Ifá* dropped out in the course of *Ifá* training. Those that graduated to the initiation stage are entitled to receive *ìbò Ifá.*[31]- *Ifá's* lots- received by the initiated *Ifá* priest. The ability of the Ifá trainee to interpret the *Ifá* initiation corpus is another challenge to be overcome by the *Ifá* trainee. That is his ability to decode and interpret *the Ọ̀bàrà-kànràn* epistle. The proficiency of *Ifá* trainee in *Odù Ọ̀bàrà-kànràn* "forms the climax of many years of hard work" (Abímbọ́lá, 1977a, p. 13). Even though ayò training is informal, the skill and game strategies to prove one's dexterity are evidenced. This is why it is often said that "ẹni to pani layò lè pani lógun" (Ọládapọ̀, 2010, p. 102). That is, whoever can defeat in *ayò* game can overcome in war. The spirit of patience and perseverance are moral virtues to be possessed by whoever is likely to win in *ayò* competition because a loser may eventually win after being defeated once or twice in the game.

Post-Initiation Stage of *Ifá* Divination and *Ayò ọlọ́pọ́n'* Memes

Post-initiation is the third stage in *the Ifá* divination process. This stage is a lifelong experience. The stage is marked by an additional *Ifá* corpus knowledge beyond Four Thousand and ninety-six plus (4096+). The stage has no end because *Ifá's* knowledge is elastic. This stage is marked with the C stage in the *ayò ọlọ́pọ́n* diagram indicated with one

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[31] "The *ìbò* is used to select quickly the possible 'stories' in the corpus that would apply to the client" (Abimbọ́lá, 1976, p. 12).

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above. The "post-initiation stage is the period the trainee seeks to specialize in some or the other of the aspects, like divination, healing, *Ifá* sacrifices, poetic rendition and interpretation of *Ifá* verses, etc." (Akíntọ́lá 1999: 13). However, because of the inexhaustible knowledge in *Ifá* 'no priest of *Ifá* can excel in his work without this post-initiation stage" (Abímbọ́lá 1983: 9). All Ifá priests highly regard the "post-initiation training… learning of more poems in areas not covered by his previous training. This gives the *Ifá* priest a polished and refined personality which marks him out from the generality of his fellow men as a well-informed, well-traveled and highly disciplined individual" (Abímbọ́lá, 1977a, p. 13).[32]

This systematic *Ifá* training makes *Ifá* corpuses to be preserved through the impartation of *ẹsẹ-ifá* from one generation to the other. This is how the Yorùbá non-literate societies "develop, preserve and transmit bodies of academic knowledge without knowing the art of writing… Initiation is not, however, the end of the training of the *Ifá* priest" (Abímbọ́lá, 1977a, p. 13). The post-initiation stage has no end since there is no end to human knowledge and experience. Sometimes, post-initiation training may involve traveling miles to acquire more knowledge from reputable *Ifá* priests. This may require years of knowledge acquisition. The knowledge of *Ifá* is transmitted and acquired, that is inherited from one generation to the other, "most important ingredients of their repertoire from one generation to another without adulteration" (Abímbọ́lá, 1983, p. 13). The multiplication of *ayò* seeds in the six holes (a row): 4096+ symbolizes this in *ayò-ọlópọ́n*. Since the knowledge of *Ifá* is inexhaustible *àmọ̀ọ̀mọ̀tán*, there is no marked number of *Ifá* corpora to be mastered in *Ifá* divination. "The term *àmọ̀ìmọ̀tán* can be translated into English to mean 'that which is incapable of being completely known. Hence, the term phenomenological, *amọ̀ìmọ̀tán* means the belief and perspective of mind which holds that the perceptible presence of an object as well as its substance is incapable of being fully or completely known or cognized. This perspective does not, in any way, deny the existence of the object

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[32] *Ifá*, like any other professions such as Lawyers and Doctors, to be inducted into the practice is one thing. However, it is another thing to excel as a practitioner.

concerned" (Akìwọwọ, 1983, p. 143). *Ifá* divination learning process is a lifelong ––unending one. That is, "the period of studying *ẹsẹ Ifá* never ends; a diviner keeps on learning until he dies" (Ajayi 2002: 9). Since there is no number of *ẹsẹ-Ifá* symbolizing this stage in *Ifá* divination, the figure or number cannot as well be represented.[33], specified or proposed in *ayò ọlópọ́n* just as it was unspecified by *Ifá* corpus.

The geometry progression rule states that:

$$a + ar + ar^2 + ar^3 + \ldots ar^{n-1}$$

a = first term

r = common ratio

The geometric progression in pre-initiation, initiation, d post-initiation stages are 4, 16, 64, 256, 1024, 4096…as indicated by the product of 4 geometry progression in *ayò-ọlópọ́n* in picture 1.

Observe that $\frac{16}{4} = \frac{64}{16} = \frac{256}{64} = \frac{1024}{256} = \frac{4096}{1024} = 4$

Looking at the G.P. above, 4 is the common ratio across the stages. This relates to *an ayò-ọlópọ́n* system where the distribution of 4 *ayò* seeds (as indicated in figure 1) in each hole of the ayò board is mandatory.

Ifá numerology can also be expressed or calculated in index form, which can be applied to *ayò-ọlópọ́n* numerology as well. Index (indices) in Mathematics is the power or exponent raised to a number or a variable. For example, in number 2^4, 4 is the index of 2. It shows the number of times a given number has to be multiplied. That is:

a^m = a × a × a ×…...× a (m times)

As in 2^8, 2^{10}, 2^{12}

Application of one of the three laws of indices (the second index law) states that:

$$\frac{a^m}{a^n} = a^{m-n}$$

$$\frac{2^{12}}{2^8} = 2^{12-8} = 2^4 = 16$$

$$\frac{2^{12}}{2^{10}} = 2^{12-10} = 2^2 = 4$$

The index form of 16 is 2^4, and 4 is 2^2.

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[33] This is indicated by a plus (+), meaning that the other numbers are not prescribed.

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Analysis with the principle of the index to calculate and describe *the ayò* system *concerning Ifá* professional training numbers as indicated in picture 1 and Table 2 is expressed by Table 2 below:

$$(a^m)^n = a^{mn}$$

Table 2. Showing the Index in *Ayò-ọlópọ́n* in Relation to *Ifá* Numerology.

4	16	64	256	1024	4096
$(2^2)^1$	$(2^2)^2$	$(2^2)^3$	$(2^2)^4$	$(2^2)^5$	$(2^2)^6$
$2^{2\times1}$	$2^{2\times2}$	$2^{2\times3}$	$2^{2\times4}$	$2^{2\times5}$	$2^{2\times6}$
2^2	2^4	2^6	2^8	2^{10}	2^{12}

Table 2 gives the total calculated index from 4, 16, 64, 256, 1024, and 4096, as indicated in picture 1, showing the distribution of *ayò* seeds in a G.P form. From the indexing Table, the pre-initiation stage: is 2^8 (256), the initiation stage: is 2^{10} (1024), post-initiation stage: is 2^{12} (4096), as indicated by the sum of *ayò* seeds in index form in picture 1.

       This is the case when geometric progression is used to find four as the common factor, adopting the third index law, in addition, validates the same as:

Third Index Law $\dfrac{a^m}{a^n} = a^{m-n}$

$$\frac{2^{12}}{2^8} = 2^{12-8} = 2^4 = 16$$

$$\frac{2^{12}}{2^{10}} = 2^{12-10} = 2^2 = 4$$

As indicated in cell one, 4 is the common factor of the numbers.

***Ifá* and *Ayò-ọlópọ́n's* Memes in First Movement of *Ayò* Sowing**

In this section, the effort is made to associate the first movement of sowing seeds by each *ayò* player. It is believed that every harvested *ayò* seed symbolizes one or two cultural activities. However, this is the only predictable movement of sowing by both players. This is why this study

limits its analysis to this movement of *ayò* sowing. Other movements of sowing *ayò* seeds are unpredictable- the symbolism cannot be determined beforehand. Each player sows four ayò seeds.[34] After sowing, the four ayò seeds are taken into any of the holes from the player's row, dropping one seed in a hole. The movement is anticlockwise if the seeds are sown to the opponent row. This is a movement by which capturing or harvesting can be made. However, the movement of sowing of *ayò* seeds can also be limited to the player's row. This is a clockwise movement, with which no harvesting is possible. The arithmetic progression rule is applied for the analysis, as shown in figure 2 below.[35]
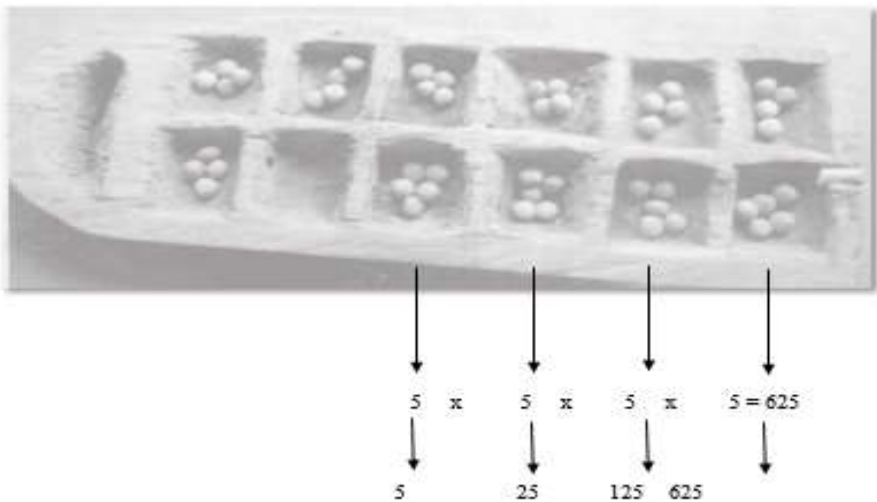

Figure 2. Showing Geometric Progression in *Ayò ọlọ́pọ́n* in Relation to *Ifá* Numerology

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[34] 4 is the common factor indicated by the arithmetic progression in the stages of Ifá training.

[35] The researcher supplied the symbolism of the first movement of play in *ayò* and their possible symbolism in *Ifa* and Yorùbá culture.

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Table 3. Showing the First Sowing of *Ayò* Seeds in Relation to *Ifá* Numerology.

s/n	*Ifá* symbols	*Ayò ọlópọ́n* symbols
(i)	5	5
(ii)	25	25
(iii)	125	125
(iv)	625	625

Unlike the *Ifá* training numerology in geometric progression, where 4 is the common ratio, the above 5 is the common ratio in arriving at the calculated geometric progression numbers. The stages that account for each number are given below:

5: Symbolizes the number of *ayò* seeds in a hole of *ọpọ́n-ayò*. In *Ifá* divination, it symbolizes[36]:

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[36] (i) Number of outlets in sacred nuts of *Ifá* empowerment (Adéoyè, 1985)

(ii) Amount of cowries for obligatory *Ifá* consultation fees, that is, 2 + 3 = 5: symbolized with 2: *eéjì adìbò* and 3: *ẹẹta ìtẹ́ní*. For instance, *Ọ̀yẹ̀kú Méjì* explains these symbols of *Ifá* pre-divination:

> *Eéjì: èrù tí ìbò ifá ó gbà/* Two: for lots is received from the client by *Ifá* priest.
> *Èyí jẹ́ ara owó tí babaláwo ń gbà gẹ́gẹ́ bí erù/* This is part of offering that *babálawo*
>   receives as gift.
> *Ẹẹta ìtẹ́ní ni owó tí babaláwo ó gbà, kó tóó tẹ́ní láti dá Ifá/* Three: for mart spreading is money that *Babalawo* receives before he spreads mat to perform divination.
>
> (Abímbọ́lá 1968: 32).

25: This symbolizes the products of *ayò* seeds in two (2) holes of the game board, that is, 5 x 5   = 25. In *Ifá* divination, this symbolizes:[37]

125:    This symbolizes the products of three (3) holes of *ayò* seeds, 5 x 5 x 5 = 125. This symbolizes the square feet per person for the land surface in *the Ifá* divination symbol (McGEE, 1983).

625: This symbolizes the products of *ayò* seeds in four (4) holes of *ọpọ́n-ayò*, that is, 5 x 5 x 5 x 5 = 625. By the previous knowledge acquired in this work, one can derive and link *Ifá/ayò ọlọ́pọ́n* together. For example, this symbol is associated with several estimated Yorùbá deities: (401) and days in the old Yorùbá year (224): (401 + 224 = 625). This suggests a strong relationship between the Yorùbá religion and their calendar. In other words, there is a kind of synergy between *ayò ọlọ́pọ́n* and *Ifá* divination through which we can account for their numerical symbolisms. The above can be calculated geometric progression: 5, 25, 125, 625…

Observe that $\frac{25}{5} = \frac{125}{25} = \frac{625}{125} = 5$

Here, 5 is the Common ratio

The nth term of the sequence is given by…

$$a_n = ar^{n-1}$$

For instance, Consider the G.P 5, 25, 125… find the ^fourth term.

Using the formula ar^{n-1}

a = 5

r = 5

n = (4th term)

Therefore $a^{n-1} = 5(5)^{4-1} = 5(5)^3 = 5(125) = 625$

Other *Ifá* numerical symbols can further be linked to *ayò-ọlọ́pọ́n* numerology. However, the sets of *ayò* seeds on the board in picture 1 and the first movement of sowing of *ayò* seeds in picture 2 are demonstrated as related to applications of geometric progression and indices.

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[37] (i)   Number of days used by the deities to descend on Earth (Adéoyè, 1985). That is, "ojó méẹ̀dógbòn tí í ṣe   oṣù kan ayé ìgbà náá ni wọ́ fi rò" (Adéoyè 1985: 29).

 (ii)   Number of days in a Yorùbá ancient month (Adéoyè, 1985).

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Conclusion and Recommendations

This study concludes that *ayò-ọlọ́pọ́n* and *Ifá* divination numerology work around common ratios 4 and 5 in an arithmetic progression and index principles. *Ifá* numerology training stages- pre-*Ifá* initiation, *Ifá* initiation, and *Ifá* post-initiation stages, Yoruba divinities and calendar are encapsulated in *ayò-ọlọ́pọ́n* numerology. The study recommends that there is several nexus in-between *Ifá and ayò-ọlọ́pọ́n's* systems. That other function(s) outside of relaxation and entertainment associated with *ayò-ọlọ́pọ́n* is a result of the relationship of *Ifá* to the game. *Ayò-ọlọ́pọ́n* is an extension of *Ifá*, and therefore, *Ifá and ayò-ọlọ́pọ́n* numerology are memes.

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