SIMULTANEOUS MULTIDIMENSIONALITY IN AFRICAN MUSIC: MUSICAL CUBISM[1]

by

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Introduction

"Simultaneous multidimensionality" names a condition prevalent in many African traditions of performance art in which music is coherent from different aural and kinesthetic perspectives at the same time.[2]

This changeable, plural quality is preset in composed musical works and, in musical performance, affects on-the-spot decisions. The perceptual conditions that enable this plural mind-body cognitive condition are particularly likely to arise in polyphonic genres of dance music whose phrases are structured within a 3:2 (three-in-the-space-of-two) temporal framework. Simultaneously multidimensional music can have charismatic force that is capable of generating a transformative affective experience in knowing listeners. This musical style can reinforce a worldview that accepts paradox – for example, a singularity can be a plurality – and finds unity in apparent oppositions – for example, between the seen and the unseen, or the equivalence of two and three. The quality of simultaneous multidimensionality warrants consideration as a fundamental dimension in a general theory of structure and aesthetics of African works of performance art.[3] In this paper, analysis of *Nakohi-waa*, a work of Dagomba dance-drumming (Ghana), will exemplify the nature of this approach to making music. My knowledge of *Nakohi-waa* comes from my studies with the late Abubakari Lunna over the period 1975–2009.[4]

In many kinds of African music, performers set up dynamic steady states whose

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1 I delivered preliminary versions of this paper as a colloquium at Tufts University Music Department in 2005 and at the Annual Meeting of the Society for Ethnomusicology in 2006.

2 Although not always called "simultaneous multidimensionality", the musical quality referred to by this term has been a topic under consideration in my scholarly publications, including Locke (1978, 1982, 1990, 1991, 2004).

3 Non-African music scholars consistently have observed this quality in African music (see Brandel, Chernoff, Hornbostel, Jones, Knight, Pantaleoni, Stone, and Waterman). African and African-American scholars, on the other hand, do not emphasize this quality in the music to the same degree and chose to emphasize the more representational, narrative dimensions of the music (see Nketia, Nzewi, Agawu, Anku, and Wilson). Charry and Arom similarly focus on the unifying qualities of African music time.

4 For an excerpt of Alhaji Abubakari's life story, see Locke (2005). The full text of this narrative is on a website devoted to Dagomba dance-drumming (http://dagomba.uit.tufts.edu).

features recur again and again while also being ever changing.[5] In music like this, a cleverly arranged pattern of sound goes round repeatedly within a fixed span of time, providing an opportunity for a culturally attuned listener to hear in the mind's musical ear a rich set of composite or resultant melodies.[6] Cyclic procedures as well as sequential techniques produce what might be termed sonic sculptures or musical mobiles. Composers fix multideterminant components into their musical designs; performers bring this multi-faceted time–space condition into being; and listeners actively participate in hearing the multivalent potential of a familiar item of repertory, often demonstrating their insight with hand-clapping or dance. Not all idioms of music in Africa exhibit this geometric quality, but simultaneous multidimensionality exists in traditions of music from many parts of Africa. I have personally experienced this phenomenon in dance-drumming from Ghana and *mbira* music from Zimbabwe. So widespread is this musical condition that I propose it for consideration as among the defining characteristics of an African approach to making music.

Running through this paper as a secondary theme is the use of comparison as a heuristic method. Specifically, I will contrast African traditional performance arts with European fine art painting in the cubist style.[7] Since this is a far-fetched and perhaps controversial scholarly move, let me contextualize with a personal note about my role as a teacher. Searching for a memorable label for simultaneous multidimensionality to use with contemporary Americans, I applied the phrase "musical cubism" because the dynamic homeostasis of African music reminds me of how visual artists in the Cubist School render a subject from different visual and temporal perspectives simultaneously.[8] As a teaching tool, the term "musical cubism" enabled students who are familiar with 20th century European fine art to correlate their understanding of cubism with their experience of African music.[9] At first, I intended the term as nothing more than a playful way to connect something already known (paintings by Picasso, for example) with something newly encountered (African drumming) but, subsequently, I realized that the technical concepts and vocabulary of cubist art criticism are highly germane to the discussion of

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5 See Kealiinohomoku (1976) for excellent discussion of the heuristic value of the concept of homeostasis for interpretation of culture.

6 In a seminal article Kubik (1962) differentiates three kinds of musical "image" – motor image, played image and heard image – and introduces the concepts of "inherent rhythm", "composite rhythm", and "resultant rhythm". Berliner's extensive work on Shona mbira gives full application of Kubik's insight.

7 For an overview of comparison in the discipline of ethnomusicology, see Nettl (2005:60).

8 Since 1979 I have taught academic and performance courses about African music at Tufts University, especially the singing, dancing and dance-drumming of the Ewe and Dagomba people of West Africa (Ghana, Togo). In Boston, Massachusetts (USA), I also teach and perform these traditions in a community-based ensemble called the Agbekor Drum and Dance Society.

9 In this paper "cubism" uncapitalized subsumes the many innovative styles of art that emerged roughly from 1900 to WWII. "Cubism" capitalized refers specifically to the style invented by Pablo Picasso and Georges Braque.

African music.[10] Although the cultural meaning of cubist visual art is drastically different from African performance art, there are intriguing areas of correlation. Furthermore, the broader discussion among art historians about the cultural and historical relationship of Africa and Europe in the cubist period (roughly from 1900–1940) engages subjects such as imperialism, primitivism and modernism, which surely have continuing relevance.[11] This paper explores the value of placing African traditional performance arts in critical contact with European modern fine arts.

The Polyrhythmic Texture of *Nakohi-waa*

Nakohi-waa (literally, butchers' dance), a genre of dance drumming from the Dagomba people of northern Ghana, vividly illustrates the phenomenon of simultaneous multideterminancy in African music (see Figure 1). Two types of drum are used: the hourglass-shaped tension drum (*lunga*) and the cylindrical-shaped bass drum (*gung-gong*). The ensemble has four roles: lead *lunga* (one drum), answer *lunga* (many drums), lead *gung-gong* (one drum) and answer *gung-gong* (one drum). This paper discusses the presence of simultaneous multidimensionality in the nexus of phrases that Alhaji Abubakari taught to me as the inherited tradition of *Nakohi-waa*. I argue that this concept yields elegant and meaningful musical analysis and suggest that the art criticism of cubism raises topics of value to music scholars.[12]

The multipart texture of *Nakohi-waa* is graphically represented (see Figure 1).

I use modified staff notation to draw an ideal model of the piece (see Arom 1991: 174–175). Isochronous temporal units are axiomatic; the fastest pulse (density referent) is set on sixteenth notes, with eighth notes representing the quick pulses that may be active in a player's awareness.[13] For the *lunga* drums, the vertical position of a note head indicates its pitch class; for the *gung-gong* drums, oval-shaped note heads signal an open, bounced tone, while an x-shaped note head represents a closed, pressed tone (see Figure 2).

Vocables appear in the lyrics area below the staff. Above the staff, brackets mark the beginning and ending of phrases, which may or may not coincide with the bar lines. Bar lines shape the flow of time into spans of six pulses. Within the measure, time is felt as a three-in-the-span-of-two simultaneity (3:2) represented as the interaction of

10 For general introduction to Cubism and its milieu see Shattuck and Goldwater.

11 See Flam (2003) and Rubin (1984).

12 Chernoff brought attention to Dagomba music-culture in his interpretive treatment of African expressive culture (1979); his paired film and article are a more traditional ethnographic account (1984). Chernoff has in progress a comprehensive study of Dagomba cultural history. Djedje's comparative study of Dagomba and Hausa one-string bowed lutes establishes a regional setting for this style. A website hosted by Tufts University presents a large body of text, graphic and audio materials on Dagomba dance-drumming music (http://dagomba.uit.tufts.edu).

13 Rainer Polak presents compelling evidence for the culturally patterned, systematic presence of non-isochronous pulsation in dance-drumming in the West African Mande ethnic heritage.

three, binary, quarter note beats with two, ternary, dotted quarter note beats.[14] Moving twice as fast as dotted quarters (2:1), dotted eighths imply two-in-the-span-of-three (2:3) interactions with the eighth note pulses and four-in-the-span-of-three (4:3) interactions

Figure 1. *Nakohi-waa* multipart texture

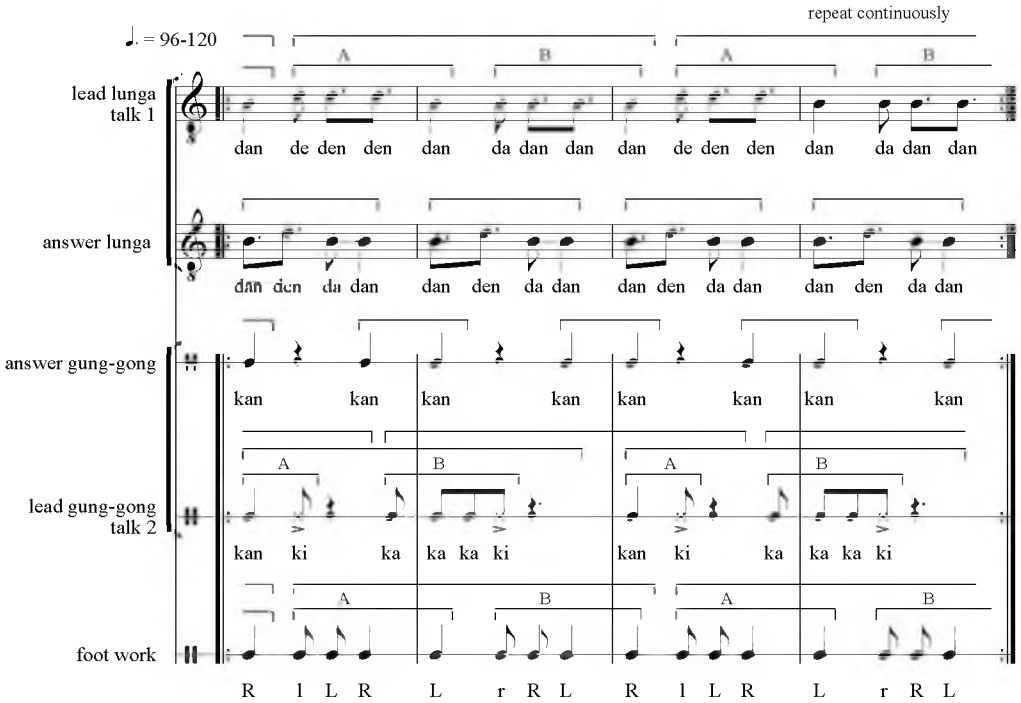
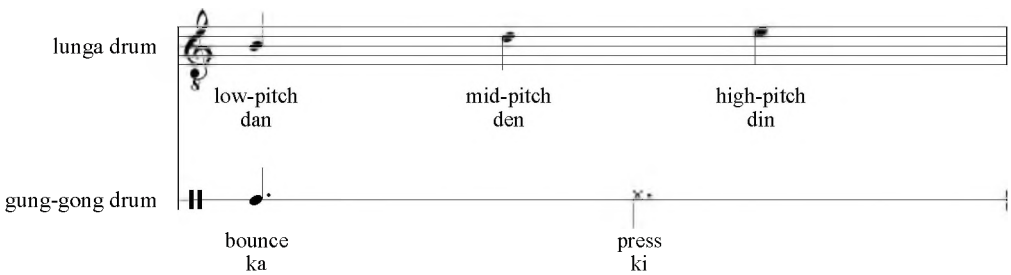


Figure 2. Dagomba drums: Key to notation

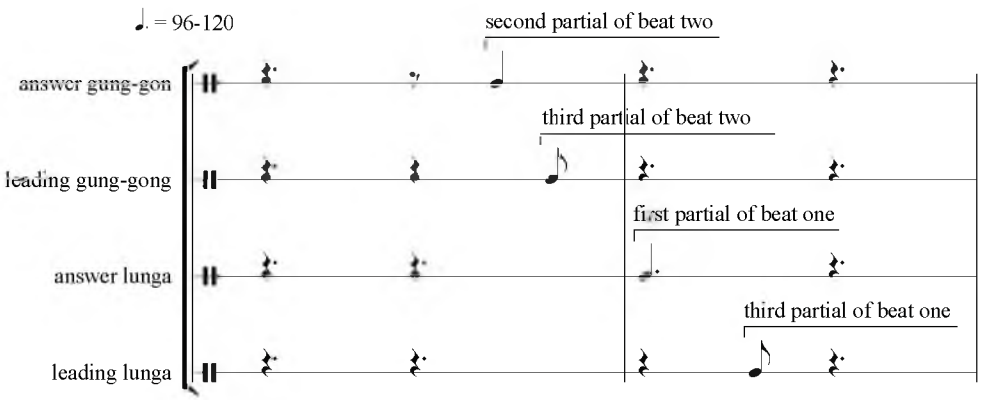


[14] Clarity of technical terminology surely helps when writing about music. I use the following naming convention for designating the metric function of beats: down-beat – pulse one in the measure, on-beat – first pulse in a beat, off-beat – any position within a beat other than pulse one, up-beat – midpoint between successive on-beats, back-beat – on-beat two in a two-beat measure and on-beats two and four in a four-beat measure. The suffix "-ary" serves to denote the quantity of pulses within a beat, that is, ternary time has three pulses per beat, while binary time has two pulses per beat. The suffix "-ple" is reserved to denote the quantity of beats per measure, that is, duple, triple, quadruple and sextuple time signals two, three, four and six beats per measure, respectively.

with the quarter note beats. Rests visually mark on-beats on which a drum stroke is not played or, in analytic figures, help clarify an aspect of musical interpretation. The music is assumed to recur steadily at the tempo indicated.

As mentioned above, musical roles of the *lunga* drums in Dagomba dance drumming are two, namely, "lead" and "answer", to use the English terms that have emerged from my apprenticeship with Alhaji Abubakari. The leading *lunga* commands the ensemble by playing the "talks" that are traditional to a given dance, as well as proverbs and comments that are pertinent to the people present at the event. The traditional phrases contribute to *Nakohi-waa's* circling musical geometry while the contingent social commentary adds a narrative, topical character to the music. Answer *lunga* drums play a recurring phrase particular to a given dance that establishes musical counterpoint to the lead *lunga's* phrases. Some dances, such as *Nakohi-waa*, have two *gung-gong* parts: a supporting player lays down a steady groove on one drum while the "soloist" moves through variations and improvised passages, defined by Alhaji Abubakari as "drumming with no talk", that is, without semantic meaning in language. Among the special qualities of *Nakohi-waa* is the way each musical phrase begins at a different moment within its recurring musical circle (see Figure 3).

Figure 3. *Nakohi-waa* offset starting moments of drum talks



Sound Color: Interplay of Order and Chaos

Art criticism of cubist works draws attention to the way painters purposely juxtaposed rational, orderly, conventional images with a visual representation that is irrational, disorderly and unconventional (see Antliff and Leighten 2001). Alerted to this expressive device, I found its analog in sound of the drum ensemble.[15] *Lunga* drums have definite

[15] For a recorded example of *Nakohi-waa* see track 5 on *Drum Damba* (Locke 1996). Excellent sound recordings of Dagomba music include *An Exponent of Bamaya* (Zadonou 2001) and *Drumming for Dagomba Chiefs: Tamale Ghana 1985* (Locke 2008); see also Chernoff (1992).

pitches that are controlled by the player's left arm technique of squeezing and releasing the cords that connect the two drum heads.[16] Capable of gliding between pitch classes, the *lunga* drum can easily represent spoken language. Each drummer consistently intones three pitch classes (low, mid, high) to make melodies with three intervals (minor third from low to mid; major second from mid to high; perfect fourth from low to high). In ensemble, however, the many *lunga* drums are not tuned to each other. Abubakari Lunna would compare the sonic disorder of many *lunga* drums sounding together to the sound of many people talking: just as the register and timbre of each person's voice is unique, every *lunga* drum has its ideal resonance. In other words, each *lunga* is melodically rational but the tonal relationship among the many *lunga* drums being played at the same time is not intentionally controlled. Although the *gung-gong* drums cannot change pitch – and thus are less capable of representing spoken language – a snare across drum skin gives the drum two musical voices: (i) bounce and press tones of centre-of-the-head strokes, and (ii) buzzing tones from above-the-snare strokes.[17]

In terms of sheer ensemble sound, the music of the *lunga* and *gung-gong* drums contrasts rational tone with irrational noise. For Dagomba drumming, this dualism is a given, an expected feature of the inherited tradition. In contrast, European cubist artists intentionally played visual order against optical chaos (pictorial mimesis, written words, and collage using newspaper clippings versus pictorial distortion, abstraction, and violation of the principles of one-point perspective) in order to challenge their received heritage and convey sentiments of disruption that were appropriate to their era.

Universal and Local Communication

In both Cubist painting and Dagomba dance-drumming, aesthetic tension arises from the semiotic interplay of universal versus local signifiers. Aesthetically and semiotically, the presence of drummed language in instrumental music is similar to the use of newspaper clippings in Picasso's collages; that is, it contrasts the universal communicative reach of abstract music with the local specificity of an in-group semantic code.[18] Because drummed music almost always sets expressions of vernacular language, Alhaji Abubakari Lunna would refer to musical phrases as "talks." While every listener can enjoy dance drumming as instrumental music, knowledge of the semantic meaning of drum "talks" is unequally distributed even among fluent speakers of Dagbani. Well-trained children of chiefs and drummers are expected to know drum language – knowledge that differentiates them from commoners who have less access to the meaning of drumming.

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16 See Locke (1990) for detailed account of drumming technique.

17 It is tempting to allow the English language to encourage a comparison of drum stroke to brush stroke. Subtle differences of the timing and articulation of drum strokes in every playing of a phrase are reminiscent of the individuality of each stroke of the painter's brush. The musical phrases and themes repeat but the music-as-played always is changing. Notation threatens to mislead a reader by failing to represent the individuality of every note and constant interactivity among musicians (see Keil 1995).

18 See Karmel (2003:116).

Both cubist painter and Dagomba drummer intentionally keep secrets from their viewers or listeners. The artistic creation may be contemplated for its immediate sensory quality, but members of the audience, so to speak, know that something is being withheld or obfuscated. In both idioms the act of reception includes puzzle-solving, going beneath the surface, and active perceptive cognition.

Repetition: The Enabling Condition

Repetition is a crucial enabling condition for musical simultaneous multi-dimensionality. By virtue of repetition, the recurring multipart texture achieves a sculptural persistence that integrates musical figure-ground relationships, that is, sounded musical phrases are perceived in terms of a tacit tonal and temporal framework.[19] In performance, answer *lunga* and answer *gung-gong* continually reiterate their "talks" with minimal overt change; lead *lunga* and lead *gung-gong*, on the other hand, play "talks" that the player selects from a pre-composed set of phrases that are associated by tradition to the piece. Drummers sound a "talk" many times before playing another.

Musical repetition like this, it seems to me, is analogous to the "faceting" technique in Cubism painting, that is, the rendering of an object as an arrangement of geometric planes on a flat surface.[20] Because cubist art asks viewers to accept their visual responsibility to make sense of these planes, the cubist style incorporates the act of reception into its very technique. Not only is the object given height, width and depth, but it is also complexly placed in time – the present time of the viewer, as well as the various histories of the painter and the imagined object itself. Similarly, the African musical object – in this case, the recurring texture of *Nakohi-waa* – can be conceptualized as an arrangement of "sonic planes". Each recurring part in the musical whole presents one facet of the whole piece, which must be constructed from the vantage point of the listener. African music with the quality of simultaneous multidimensionality draws listeners into the process of creation.

Dance: The Patterning of Musical Time

As is the case in many of the world's performance traditions, dance frames music's temporal period and helps establish the fundamental patterning of musical time (see Figure 4).[21]

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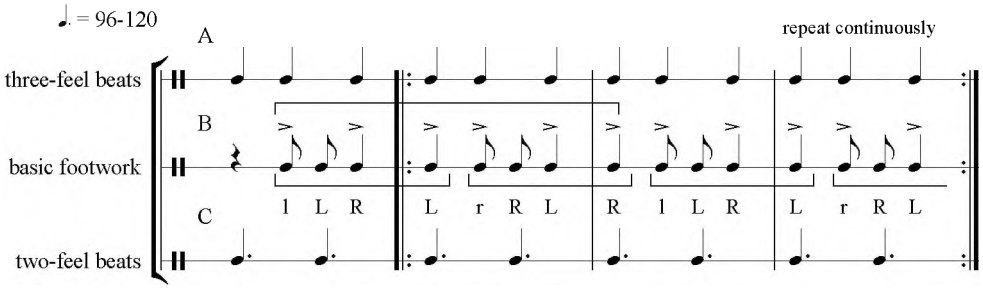
19 Anku's highly elaborated analyses of several West African traditions conceptualize musical repetition with the spatial metaphor of circularity (for example, see 1997).

20 On Picasso's use of faceting see Karmel (2003:60). Stone (2005) also uses this metaphor to discuss music-culture in Africa.

21 I discussed my dance lessons on *Nakohi-waa* with Madame Fusena Wombei in an unpublished paper presented at the Annual Meeting of the Society for Ethnomusicology, 2003.

Figure 4. *Nakohi-waa* dance footwork



The dance of *Nakohi-waa* is grounded in a footwork sequence of a kicking gesture followed by three steps that repeats on each side of the body.[22] As marked by the bracket above staff B, the time span of the full dance phrase is twelve pulses in duration. The full phrase is shaped by the dance's bilateral symmetry into two shorter phrases of six pulses each as marked by the bracket below staff B. Contrasting with this perfect 6+6 symmetry, the inner morphology of each half-phrase is an asymmetrical 4+2 (see Table 1).[23]

Table 1. *Nakohi-waa* dance foot work within 12-pulse span

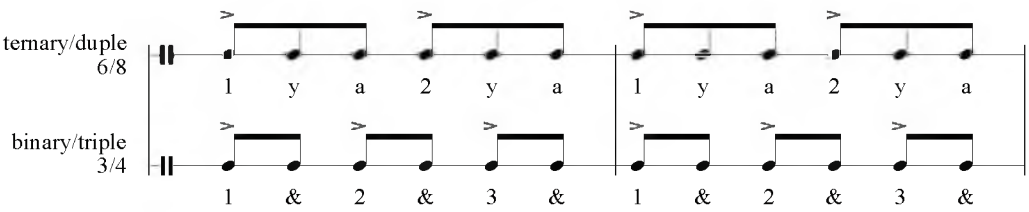
Foot work	**left**	**LEFT**	**RIGHT**	**LEFT**	**right**	**RIGHT**	**LEFT**	**RIGHT**
6-pulse count	3	4	5–6	1–2	3	4	5–6	1–2
3-beat count	2	a	3	1	2	a	3	1

As mentioned above, simultaneous multidimensionality is especially present in works of performance art permeated by the 3:2 ratio. The ratio of three-in-the-space-of two, which could be represented as the simultaneous presence of 6/8 and 3/4 meters, is embedded in *Nakohi-waa's* kinesthetic foundation (see Figure 5). According to my ethnographic research, enculturated performers feel a steady, implicit, "in two" groove – 1 y a, 2 y a – yet as shown in Table 1, the accents of the basic footwork explicitly mark time "in three" – 2 a, 3, 1 (also see the accent marks in staff B of Figure 4). In other words, as shaped by the dancer's foot movements, the music and the dance are implicitly "in two" and explicitly "in three" at the same time. Here is a core aspect of African "musical cubism": the dualism of simultaneously perceiving performance time in terms of beats containing three quick units (ternary time, i.e., 3/8, 6/8, 12/8, etc.) and beats containing two quick units (binary time, i.e., 2/8, 3/4, 6/4, etc.).

[22] Bilaterally symmetrical African and African-American dances like this provided a valuable model for Piet Mondrian, who experienced his theory of sublation through the simultaneous affirmation and cancellation in the balanced duality of the Foxtrot, which in 1920s Europe was regarded as Black dance (Cooper 2002:17).

[23] Capitalized and lower case letters demark weight-bearing steps and non-weight-bearing gestures, respectively.

Figure 5. Three-two simultaneity



The dance phrase is offset within the implicit metric frame: each phrase begins on pulse three within the measure (beat two in three-feel time, third pulse of beat one in two-feel time) and pushes to temporary resolution on pulse one of the next measure (downbeat in both time feels). In other words, the dance creates a recurring sense of motion through time towards a goal moment.[24] My study of dance provided ethnographic insight that guided my analytic decision of where to set pulse one within the music's recurring cycle.

By virtue of their relationships to action in the two half-phrases in the dance, every pulse and beat in the implicit temporal structure has a distinctive quality.[25] Each half-phrase is available to be perceived as coming after the prior half-phrase or before the subsequent one; as full phrases themselves recur, their quality is affected by their position in elapsing time. The point emphasized here is that repeated actions in *Nakohi-waa* are not precisely identical. Gertrude Stein made this point when she wrote, "Rose is a rose is a rose is a rose".[26] For her readers and listeners, Stein intended this cubist technique of repetition-with-a-difference to prolong their experience of time, to expand their sensation of the present, and to transport them from quotidian secular time into extraordinary ritual time. I find it provocative to compare her artistic ambition with the transformative power of African performance arts.[27]

[24] See Chernoff (1985:56).

[25] This statement intentionally takes issue with writers who argue that musical analysis only gets at so-called quantitative, "chronometric" features of music (Stone 1985:89). I argue that analysis should use quantity in service of discussing musical *qualities*, such as *qualities* of motion, arrival, suspense and accentuation.

[26] Stein 1922.

[27] For a classic text on the transformative potential of ritual, see Turner (1969).

Three-in-the-Span-of-Two[28]

Multidimensionality is pervasive in music with ternary temporal structure because this type of patterning of time so readily enables three-in-the-span-of-two musical action. Not only do binary-with-ternary temporal relationships play out both sequentially and concurrently, but they occur at different durational values as well. Furthermore, 3:2 figures are set on various positions within the recurring musical period. In the musical terminology of staff notation, the distinction between elapsing and simultaneous time is often characterized in spatial terms as "linear" and "vertical", a contrast that visual artist critics have called a flat, two-dimensional lattice versus a deep, three-dimensional scaffold.[29] The art critics spark insight into the possibility of permanence and depth in a listener's experience of musical time. Although music typically is regarded as being temporally ephemeral – a passage is first anticipated, then heard and, finally, remembered when the sound is no longer present to the senses – this model insufficiently theorizes African polyphonic dance-drumming. By means of repetition and rhythmic design, the music obtains what might be called geometric stability and depth.

The drumming of *Nakohi-waa* aptly illustrates characteristic 3:2 multidimensional technique (see Figure 6).[30] The four-note phrase of the answer *lunga* drum, for example, juxtaposes a two-note binary figure in beat one with a short-long ternary figure in beat two – "dan-den/da-dan": "ONE-TWO/ONE-TWO-three."[31] The lead *lunga's* phrase, which aligns exactly with the footwork and mirrors the dance in duration and morphology, similarly moves forward in oscillation between binary and ternary interpretations of sequential beats – "de/den-den/dan, de/dan-dan/dan": "THREE/ONE-TWO/ONE-two, THREE/ONE-TWO/ONE-two". When the two *lunga* drums are heard in tandem, 3:2 relationships occur in simultaneous time (see Figure 1). What a music theorist could label as cross rhythm or polymeter,[32] an art historian of the cubist period might characterize as "iridescent equivalence", words that nicely catch both the shimmering musical effect and the

[28] In Western music theory, the term "hemiola" designates 3:2 temporal relations. Although the project of analysis undertaken here may be "Western", I prefer not to borrow technical terminology that too easily assimilates African music into the frame of reference of Western classical music. For example, I do not show time signatures in the staff notation. My goal is to seek a "co-aesthetic" analytic position (see Feld 1982:236).

[29] See Karmel (2003:43).

[30] In staff notation of 3:2 temporal relations, the "three" side can be represented by a binary undotted note, the "two" side by its dotted companion. My habit is to write in time values of eighth notes and quarter notes, dotted eighths and dotted quarters, although the choice of time values is "purely academic" since the Dagomba tradition has heretofore been "writing free".

[31] Upper case numbers indicate counts on which drum strokes occur.

[32] I find it useful to use "cross rhythm" to signify a musical condition in which the underlying metric feel is shared by the musicians or unchanged in one player's feeling, as distinguished from "polymeter", which signifies a condition in which players feel time in different metres. It is a subtle, evanescent distinction that cannot usually be verified and need not be stable – a cubist condition, if you will.

conceptual inseparability of the "in two-ness" and "in three-ness" of every beat.[33]

In *Nakohi-waa*, 3:2 proportions also occur over the span of two beats, especially in the *gung-gong* section of the ensemble. The answer *gung-gong* brings the 3:2 into phenomenal reality over two beats – "kan/kan" : "THREE/ONE-two".[34] For dancers, the two centre-stroke tones of answer *gung-gong* add sonic weight to the "in three" feeling of their cadential motion to ONE (see above). In both cases, performers cognitively and kinesthetically integrate explicit "in three" action with the implicit "in two" groove.

Accented tones that are consistently timed to offbeat moments significantly enrich the field of 3:2 relationships. For example, the press strokes in the lead *gung-gong* phrase – "kan-ki/ka/ka-ka-ki": "ONE-two-THREE/one-two-THREE/ONE-TWO-THREE/ one-two-three" – repeatedly accentuate third pulses within successive downbeats (see Figure 1). This constant off-beat timing has two consequences for the music's simultaneous multidimensionality: it encourages the listener to hear the "in two" beats as being displaced to a new location within the cycle of time (from pulses 1 and 4 to pulses 3 and 6), and as a consequence it creates a new position for 3:2 between the binary and ternary beats (the second binary beat in each measure now is in unison with the flow of re-located ternary beats). Given that constant off-beat accentuation is characteristic of Dagomba dance-drumming style, it is not surprising that 3:2 patterns are launched from any time point within the temporal period.

Metre as a Matrix: The Temporal Grid

Analysis of the tangible aspects of music and dance that are present to the senses suggests the presence of an unsounded, intangible matrix of implicit beats and pulses in three-and-two proportions. I cannot assert that this implicit grid of isochronous units has ethnographic reality, although I can report that none of my teachers have ever spoken of it.[35] But "the proof may be in the pudding", as the saying goes: The concept of a "metric matrix" can elegantly explain the rationale and expressiveness of musical behaviour and results. It also is a useful tool in teaching about African polyphonic dance music in cross-cultural settings. For the study of African rhythm, I assert that a noumenal metric grid of three-and-two equivalences has heuristic value for understanding musical action in the realm of sensate phenomena.

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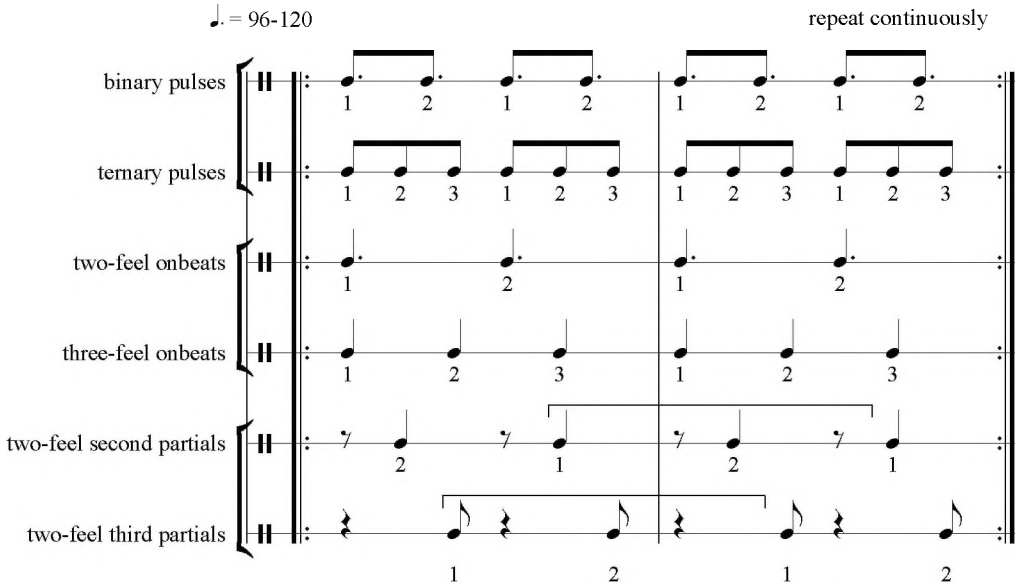
[33] See Gray (1953:95).

[34] To save left-to-right linear space in staff notation, I represent the mnemonic vocable for *gung-gong* centre strokes as "ka" but Alhaji Abubakari prefers his students to chant "kwao" since it sounds more like the actual sonic envelope of the drum's tone. In vocables of *lunga* and *gung-gong* drums, the nasal "-n" indicates prolongation of a tone, i.e., a longer time value.

[35] There is evidence of the concept of beat, however. Abraham Adzinyah, my teacher at Wesleyan University (1969–1974), tells students to find a "hidden beat". Abubakari Lunna told me that good drummers sometime knock steady time for drummers who cannot maintain steady tempo. During my lessons Godwin Agbeli would play equidurational strokes for me when my time became wobbly.

Figure 6. Matrix of three-two proportions



This temporal matrix is reminiscent of the spatial grid at work in European realistic visual representation, which was based on the logical principles of Euclidian geometry. Running counter to this paper's suggestion of an affinity with cubist art, the metric matrix actually seems better correlated to the rational proportions of vanishing point perspective, which became normative in the European fine arts since the Renaissance. Artistically inspired by Cezanne and intellectually buttressed by Henri Bergson's theory of the role of intuition in humanity's ontological condition of constant change and William James's concept of selective attention in our stream of consciousness, Cubist artists subverted their received tradition of mimetic representation by "rotating against the grid". When they developed thoroughly abstract painting, cubist artists rejected Renaissance representation entirely in their search for a way to depict a quantum theory of space as an infinity of curvatures.[36]

Traditional African musicians, on the other hand, never challenge their cultural conception of time–space by, for example, having the entire ensemble play in temporally disordered relationship. Even when rife with qualities of simultaneous multidimensionality, traditional African musical rhythm maintains proportional relationships among time values. In this sense these musical styles are more conservative of the cultural status quo than their European counterparts. In the worldview of many traditional Africans, however, time and space already are understood as the interplay of quotidian and extraordinary

[36] See Antliff and Leighten (2001:85) and Cooper (2002:17, 185).

dimensions.[37] Religious practices involving spirit mediumship and shamanic trance are predicated upon this cultural outlook.[38] The African musical qualities I am correlating to European cubist art not only iconically symbolize this ontology but also engender highly elaborated, rational cultural institutions, such as spirit possession or shamanic trance, which are grounded in it.[39] As Gilbert Rouget points out, music does not in itself cause spirit possession, but it does have the potential to transform consciousness and often functions to prepare the human vessel to receive the spirit.

Perceptual Plurality

The phenomenon of musical cubism is as much about perception as it is about the organization of notes. In semiotic terms, *Nakohi-waa's* ensemble music is a composite signifier that draws expressive power from the combination of multideterminant parts.[40] By presenting to the mind's musical ear multiple simultaneous views of a musical work that is constantly in a condition of non-resolving metamorphosis, music like *Nakohi-waa* engages the listener's subjectivity.[41]

Nakohi-waa's answer *lunga* part will illustrate the many configurations a short repeating musical phrase presents to a creative listener (see Figure 7). In staff notation, the phrase of the answer *lunga* is represented by four notes that are temporally distributed over six pulses. Let us explore the musical depth of this deceptively simple pattern:

- Consider the ambiguous nature of pulsation within each beat. If the ternary pulsation in beat two is prolonged through beat one, the two evenly timed notes make a two-in-the-space-of-three cross rhythm (see Figure 7A), but if the binary pulsation in beat one persists within beat two, the short-long figure is a three-in-the-space-of-two cross rhythm (see Figure 7B); alternatively, a listener may also multi-metrically shift between binary and ternary orientations on a beat-by-beat basis.
- Think about the impact of the melody of the ever-recycling four notes on perception of the phrase's shape and internal motion.[42] Because notes one, two and four all are low-pitched, the mind naturally binds them into a group but since they all have the same pitch, any one of the three notes may be perceived as the first note of the phrase (see Figure 7C–E).[43]

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37 See Mbiti (1990). The subject of affinity versus correlation between non-Western and Western culture is vigorously debated in various articles in Rubin.

38 For example see Friedson (1996) and Katz (1982).

39 See Rouget (1985).

40 See Karmel (2003:120).

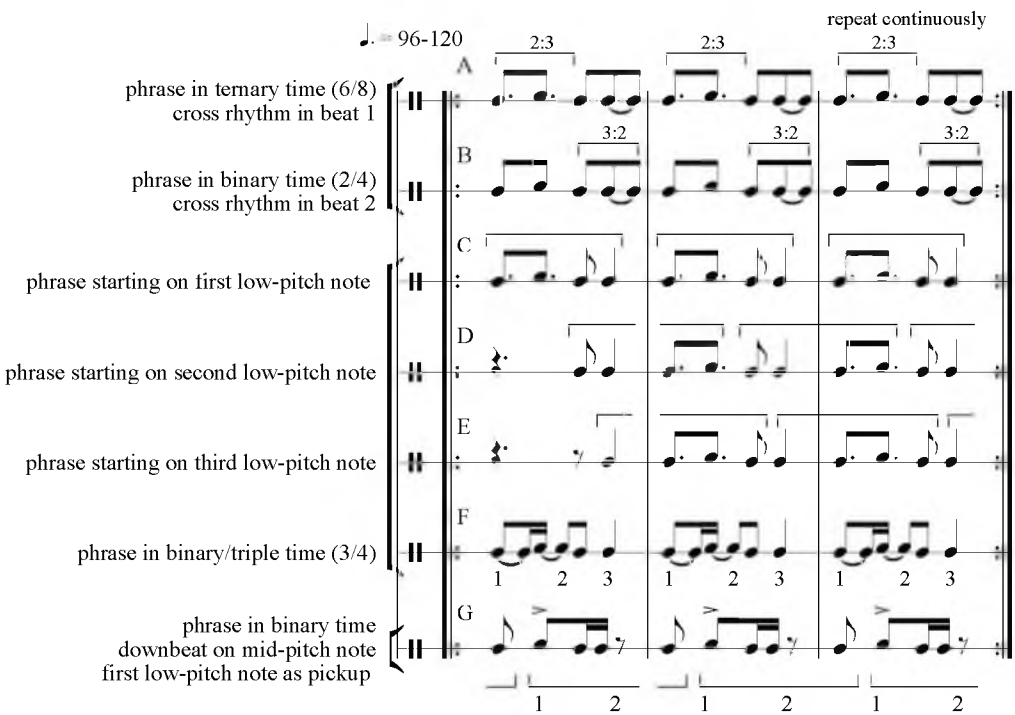
41 Since hearing is more than an auditory sensation, a culturally conditioned way of listening needs to be addressed especially in a cross-cultural setting like this. My argument is that Africans are enculturated to respond to music in the creative manner I am discussing even if they might not hear all these specific configurations.

42 Nzewi also uses "recycling" in his suggestions for culturally appropriate lexicon for analysis of African music (1997).

43 I am drawing on attributes of grouping in Gestalt psychology, i.e., proximity, similarity, symmetry, good continuation and common fate. See Wertheimer (1982).

- What of the structure of beats within the phrase's time span? Ethnographic evidence gathered from qualified Dagombas teaches us that the culturally correct way to hear *Nakohi-waa* is in ternary-duple time (6/8) and, certainly, the answer *lunga* phrase can readily be felt "in two" since notes one and three occur on the on-beats of both ternary beats. But notes one and four occur on the on-beats of counts one and three of the three-feel time (3/4), which suggests hearing the part "in three" (see Figure 7F). A listener who forms a mental composite of answer *lunga* and answer *gung-gong* parts is likely to configure both phrases in binary-triple time (3/4).
- Finally, reflect upon the impact of the pitch of the second note in the phrase, which is raised from the other notes by a minor third. Specially marked for consciousness[44] by its unique pitch, this drum stroke serves as an off-beat accent, a displaced position for the main beats, or even as a new location for the down-beat of the phrase, now morphed in consciousness into binary-duple time (2/4) (see Figure 7G).[45]

Figure 7. *Nakohi-waa* answer *lunga* multideterminancy



[44] I first encountered the felicitous wording "marked for consciousness" in the English translation of Arom (1991).

[45] Although strokes 3 and 4 are notated as sixteenth-dotted eighth in Figure 7G they actually occur so quickly in real time that the perceived difference from the eighth-quarter timing is negligible.

In my hearing, the patterning of the answer *lunga* part's time values, morphology and pitch make it a powerful multideterminant musical object. This phrase occurs within a polyphonic setting, where it gives and takes musical force with other phrases. In performance, the composite whole circles around its music axis, enabling a creative listener to contemplate the polyphony as always in a state of becoming. Although the parts themselves do not change, the listener improvises the way to hear them from many musical perspectives.[46] This is what I mean by "musical cubism".

Displacement: Metric Paradox, Aural Contradiction

The concept of displacement was briefly raised above, when talking about the many instantiations of 3:2 relationships. In the case of the leading *gung-gong*, displacement entailed perception of subtle off-beat accentuation. The leading *lunga* part, in contrast, exerts a particularly strong type of cubist effect into the music of *Nakohi-waa*: structurally embedded displacement of the music's main isochronous units – the ternary duple beats. In this case, in contrast to all the other drummers, one player in the ensemble is oriented to a different position within the time span for this flow of beats.[47]

Talk one cues the other instruments to begin (see Figure 1). By its rhythmic and melodic design, talk one easily fits into the temporal structure shared by the other drummers (and dancers, too). After the ensemble is well underway, Alhaji instructs his students to switch to talks two and three. When these phrases are heard by themselves – for example, during a learning session – their rhythm conveys the unambiguous impression of the following timing and accentuation: DAN-dada/DEN-di/DAN-dada/DEN-dit and de/DEN-dede/DEN-da/DAN-dada/DAN (see Figure 8).

However, when these phrases occur in the context of the dance and the other instruments in the ensemble, it becomes evident that the accents of the leading *lunga* occur on the third pulse within the group's on-beats (see Figure 9C, D). From the perspective of the other players in the ensemble, the leading *lunga* player's phrases consistently accentuate moments within *Nakohi-waa's* musical circle that are permanently offset from everyone else's on-beats. From the perspective of the music theorist, talks two and three in the lead *lunga* part are most elegantly analyzed with on-beats shifted two pulses later within the six-pulse time span; in other words, on-beats normally located on pulses one and four now are felt on pulses three and six. If you orient yourself to the leading *lunga*, then all the other parts become perceived as being off-beat.[48]

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[46] For a discussion of improvisation as a good way to conceptualize composition, performance and listening in all types of music, see Benson (2003).

[47] The relationship between the lead *lunga* and the other parts is a vivid instance of musical reverse perspective. In a manner reminiscent of the technique of Cubist artists from early 20th century Europe, *Nakohi-waa* juxtaposes strong musical shapes to create negative musical space.

[48] Although this analysis assumes that metric concepts like on-beat and off-beat are relevant to Dagomba musical ethnography, other non-metric factors such as pattern-to-pattern interlock and shared fast pulse are also important (see Koetting [1990], Merriam [1982] and Stone [1985]). My analytic use of metre is inductively based on field work, not deductively presumed a priori.

Figure 8. *Nakohi-waa* lead *lunga* talks two and three set in their own metric frame

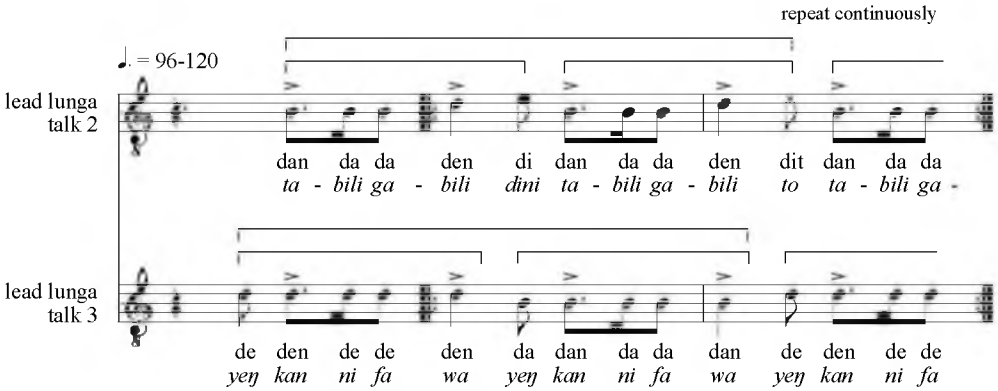
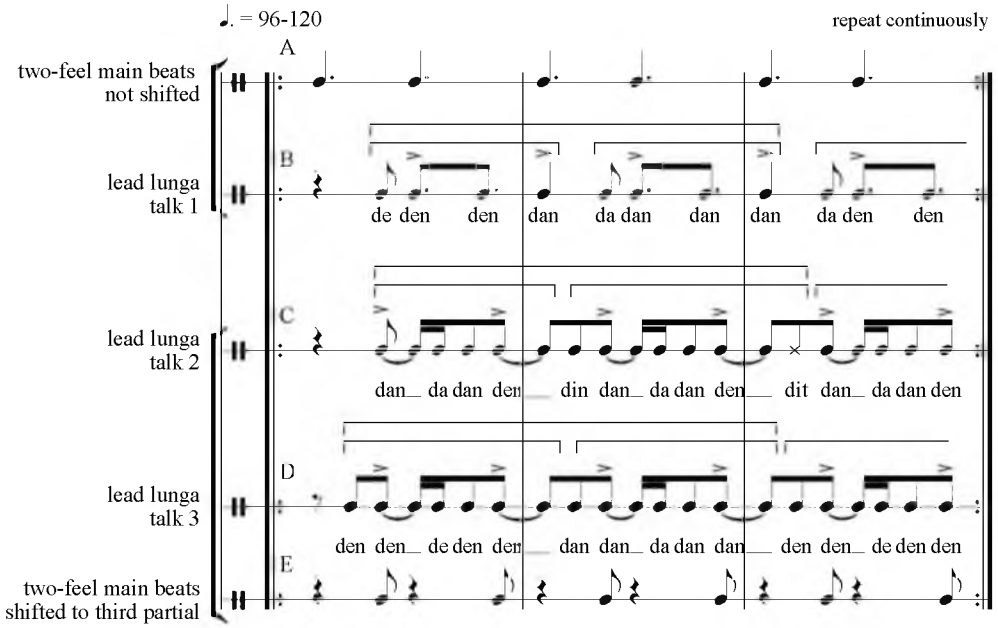


Figure 9. *Nakohi-waa* lead *lunga* talks set in metric frame of ensemble



Offset on-beats is a favourite device in Dagomba music.[49] In other Dagomba dances, such as *Tora* and *Takai*, the lead *lunga* fits with the dance steps and the other drums in just this sort of permanently displaced relationship. I have observed how this fractured musical situation challenges the musical competence of musicians from many cultural backgrounds – Dagomba, non-Dagomba Africans, and non-Africans. Analytic metaphors in scholarly writing like "kaleidophonic" (Shona *mbira*, Zimbabwe), "jigsaw style" (Kpelle horns, Liberia), and "aural illusion" (Tumbuka drumming, Zambia) bear witness to the widespread distribution in Africa of this musical technique.[50] It is a musical condition that confounds aural perception in a manner that seems illogical.[51]

European cubist artists likewise intentionally challenged a viewer's optical perception in order to critique society, comment on the human condition, and convey insight into nature of perception. While not suggesting that their goals are identical, this paper's comparison of African music to European visual art suggests that African artists and art works also utilize similar techniques to achieve profound purposes.[52]

Performance Decisions: Refreshing the "Cubist" Musical Geometry

Thus far I have applied the concept of simultaneous multidimensionality to preset, "composed" features of *Nakohi-waa*. The issue of musical decisions made during performance, that is, "improvisation", has come up primarily in connection to the discussion of creative listening to the answer *lunga* part.[53] Despite Alhaji Abubakari's high valuation for staying true to tradition, when his students would play too repetitively or without panache he would command, "Put in sugar!" My discussion of musical cubism, clearly, should encompass more than the fixed themes and phrases.

In English, Alhaji Abubakari differentiated "basic talks" and "variations" from "improvisation", by which he meant free form passages. Judging from what Alhaji

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49 Referring to it as a "clash of rhythms", A.M. Jones heard many types of African multipart music in this way and as a consequence his scores have staggered barlines Jones 1954 and 1959). Along with many other people, I have regarded this graphic move as a profound distortion of those types of African music in which all performers share common awareness of a steady, unchanging flow of beats (for example, see Agawu 1995: 188). Nketia opined that Jones mistakenly used barlines to mark phrase shape, sage advice that influenced me to show phrasing with brackets above the staff (class notes, Institute of African Studies at University of Ghana, 1975). However, for certain idioms of Dagomba music, such as *Nakohi-waa*, *Takai*, and *Tora*, I now think that Jones' approach would accurately represent the music.

50 Berliner (1993:52), Stone (2005:84) and Friedson (1996:128).

51 John Chernoff confronted this metric enigma in his studies with Alhaji Ibrahim Abdulai. Chernoff signifies on Richard Waterman's well-known assertion of an African "metronome sense" when he calls permanent off-beat phrasing "a real frontal assault on the subjective pulsations of the cooperating auditor's metronome (Chernoff 1979:99).

52 Robert Farris Thompson is particularly eloquent in linking the form and aesthetics of African arts to issues of deep cultural value in African culture (see 1969 and 1974).

53 "Improvisation" is a contested term and concept. Following Euba's concern that some readers might mistakenly regard African improvisation as unplanned or even whimsical, Ampene offers "composition in performance" as a more ethnographically accurate term for African musical improvisation (2005:8).

would play, "basic talks" and "variations" signified a set of pre-composed phrases and also the stylistically appropriate processes of these modifying pre-existing themes. This type of material always maintained the music's temporal structure and formal pattern, while "improvisation" referred to passages of virtuosic technical display that emphasized "linear" flow rather than "vertical" relationships.[54] For Alhaji Abubakari, the critically important factor was not found in music sound but whether or not the musical phrases were setting language on the drum. Drumming without meaning in language was "pure rhythm" played in a style that suspended the music's normal system. In Dagbani, Alhaji contrasted *bansim* with *golsigu*, that is, received knowledge contrasted with personal creativity. Mixing the two languages, I proposed to define variation as "Making *golsigu* on the *bansim*". Alhaji Abubakari accepted this intercultural formulation.

Now, I introduce eight phrases for the leading *gung-gong* drum to illustrate how a player energizes the multipart texture of *Nakohi-waa* by knowingly selecting variations that harness the power of simultaneous multidimensionality (see Figure 10). My argument is that the *gung-gong* players intentionally design their musical choices in order to enable and maintain the music's open-ended quality of multideterminant time. They are not mindlessly or randomly pulling phrases out of a hat, so to speak. On the contrary, the musical syntax that is activated during performance purposely tries to achieve the aesthetic goal of keeping the music in a constant state of becoming.[55]

As the following analysis shows, *gung-gong* variations use an array of musical techniques that enhance the simultaneous multidimensionality of the ensemble's polyphony: (i) repeating short figures that have multivalent accentuation potential; (ii) repeating figures with subtle difference in metric setting or notes played; (iii) changing the duration and location of phrases within the musical circle to achieve a staggered arrangement of beginning and endings; (iv) changing the structure of pulsation within main beats; (v) changing the morphology of figures within phrases; (vi) using rhythmic devices of 3:2 within different spans of time to create simultaneous and/or sequential cross rhythm or to change the metre; and (vii) constantly accentuating off-beat moments so as to shift the perceived position of on-beats.[56] Although the analysis here engages only *Nakohi-waa*, my point is that these processes usefully theorize the nature of many traditions of African performance art.

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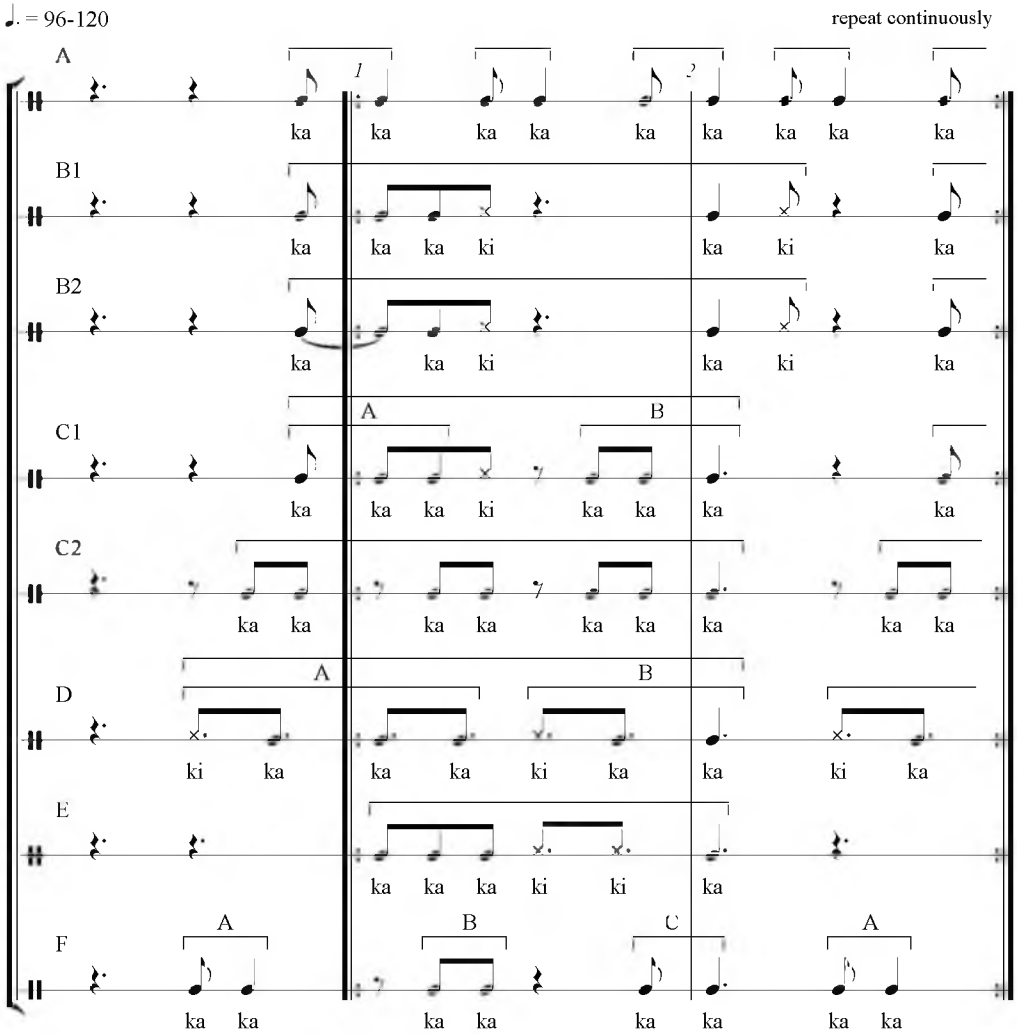
[54] Ihaji Abubakari seemed to go into musical trance during improvisations, often humming to himself, rolling his eyes upward, and becoming more physically animated than when he would be when rendering the basic themes and variations.

[55] Simha Arom, on the other hand, concludes that in the musical traditions he studied in Central Africa there is no musical syntax (1991:299). He finds only juxtaposition and concatenation without an overall logic that animates a player's choice of phrase. Perhaps this is true in the idioms Arom worked on.

[56] Compare to the list of "techniques for musical modification" in lead drumming of *Gahu*, a West African musical idiom of Ewe provenance (Locke 1988:75).

Figure 10. *Nakohi-waa* lead *gung-gong* phrases



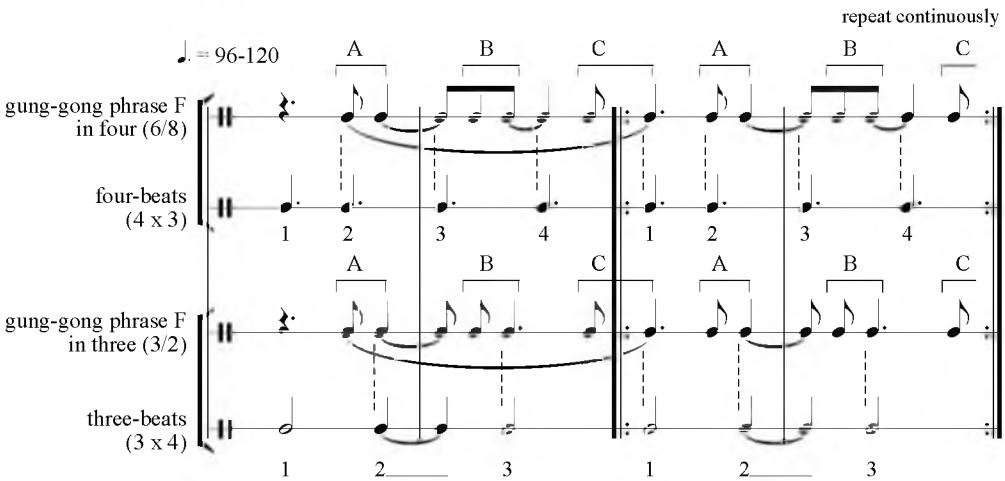
Each *gung-gong* phrase exerts its own force on the overall music: Phrases A, C2 and F work with repeated two-note figures that strike me as a musical analog of the so-called "hatching" technique in Picasso's paintings.[57] Phrase A, which brings the dancer onto the dance arena, marks three pulses of the ternary beats with a short note followed by a longer note on the music's primary on-beats, that is, pick up to on-beat motion (ka KA). An undifferentiated set of two-stroke figures, phrase A lacks strong morphological

[57] "Hatching" refers to a painterly technique of many short lines said to evoke the rough-hewn finish of African wood carvings (Karmel 2003:55).

identity, a neutral condition that allows the drummer to inject off-beat emphasis by giving dynamic accent to the short note. In phrase C2, the two-stroke figure is positioned one pulse earlier in the time span; in its third appearance the two-stroke figure is extended to achieve cadence on an on-beat – ka ka KA. Phrase C1, which typically is played before C2 already established this cadential motion.

By fitting the two-stroke figure into three units of four pulses each, Phrase F morphs phrase A into a three-in-the-space-of-four, 3:4 rhythm.[58] In cross rhythms like this, each occurrence of the repeating two-stroke figure will fit differently within the steady framework of the underlying metre: first, stroke one is on the beat, second, both strokes are off the beat, and third, stroke two completes a powerful cadence – ka KA (see Figure 11). In phrase C2, on the other hand, the two-stroke figures always mark pulses two and three within each beat, a constantly off-beat rhythm that is widespread in many other West African cultural traditions.[59]

Figure 11. *Nakohi-waa gung-gong* phrase F as 3:4 cross rhythm



[58] Mondrian's works are often cited as being inspired by the so-called "cross rhythm" of black music and dance (see Cooper 2002). It does not appear, however, that either the artist or his historians were imbuing the term with its technical meaning, that is, its basis in the temporal equivalence of 3:2.

[59] The prevalence of iambic accentuation in European languages, da-DA, engrains a culturally inappropriate perception of recurring two-note figures in African music, exemplified most notably in Jones' seminal *Studies in African Music* (1959). I hypothesize that handling of repeated two-note figures varies with ethnicity in Africa: Dagombas favour DA-da, a setting also prevalent in Shona *mbira* music (see Berliner), while in the Ewe style both notes tend to be off-beat.

Phrase D also uses two-note figures but times them to a binary treatment of the beats, unlike the ternary pulsation just discussed.[60] The musical logic of phrase D contrasts the way its first figure (A) extends through the downbeat (m.1) to the binary midpoint of beat one while its second figure (B) culminates squarely on the downbeat of the dance (beat one, m.2). Phrase D nicely exemplifies the way musicians vary the starting point of their phrases within the musical circle.

Phrase B1 simultaneously accentuates ternary on-beats, off-beat third pulses within ternary beats, and 3:2. Phrase B2 differs from B1 only in its omission of a stroke on a downbeat. This example of accentuation by negation is the musical equivalent of a visual or plastic artist's use of negative space. The unexpected silence, graphically indicated by the tied note, either accentuates the third pulse or ironically draws attention to the unsounded down-beat.

Musically, phrase C1 begins like phrase B1 but it ends with a cadence to the down-beat; in contrast, phrase B1 is silent prior to the down-beat but then flows beyond it. Phrase C1 contrasts two metric settings for the same three-stroke figure: in figure A stroke two is on the beat while in figure B stroke three cadences to the on-beat. Like phrase F, this is "repetition with a difference", a classical cubist aesthetic device.

Whereas three-and-two proportions work "vertically" in phrases F and B, phrase E presents 3:2 as a three-then-two "linear" shape that inverts the two-then-three sequence of the answer *lunga* phrase.[61]

Conclusion: Speculating on Cultural Meaning and Significance

This paper has discussed the nature of simultaneous multidimensionality in *Nakohi-waa* and has suggested that correlations between this musical style and the aesthetic structures of European cubist art justify calling this musical condition "musical cubism".[62] The project has placed traditional African music within cosmopolitan critical discourse rather than in a marginalized position of Otherness.[63] In conclusion, I will revisit the musical analysis by once again comparing African and European expressive culture.

I begin by hypothesizing similarity. Consider some significant features of the European intellectual worldview that inspired the cubist arts:

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60 For a recent discussion of the two-note figure and the issue of ternary versus binary pulsation within beats see Burns (2004). Roderic Knight also has an excellent analysis of what Burns calls "binarization" of ternary time.

61 Of course, every phrase in the multipart texture has both horizontal and vertical musical value.

62 The "Primitivism in the 20th Century" exhibition at the Museum of Modern Art in NYC was the occasion for much heated discussion about comparing so-called "tribal art" of Africa to so-called "modern art" of Europe. See Rubin, Lemke, Flam, Blake, Clifford, McEvilley and Varnedoe.

63 Agawu (2003) argues that non-African scholars proceed from an assumption of difference, asserting that this precondition likely is grounded in racism, ethnocentrism and post-colonial intellectual imperialism. Ironically, some of the ethnomusicologists challenged by Agawu cited their aversion to an a priori Eurocentric perspective as the reason to begin inquiry in African music theory without deductively assuming metre. Instead they required that the existence of metre be inductively proved in positivist data (see Merriam and Koetting, for example).

1. a paradigm of irreconcilable contradictions without a linear world view, which confounds common sense;
2. matter is flux, not stable and inert;
3. self and objects are not always contained by skin or surface;
4. space–time has many features beyond the range of human sense perception;
5. truth and meaning are relative and relational, not absolute;
6. sense perception is an active, constructive process.

The features of simultaneous multidimensionality in African "cubist" musical works like *Nakohi-waa* are, I suggest, homologous to these philosophical perspectives.

1. The metric frame of lead *lunga* contradicts the metric frame of the dance and the other instruments of the ensemble. Specifically, the down-beat (ONE) of lead *lunga* matches with the third pulse within everyone else's first beat. The music does not move in linear, narrative time towards a resolution of this perceptual enigma.
2. The multipart texture of the ensemble is always in a state-of-becoming. Phrases begin at different times and the moment of resolution is short-lived not articulated by all the parts. Recurring figures like the answer *lunga* phrase not only can be perceived to begin on any of its notes but can be heard in either ternary or binary frameworks (or both).
3. The surface of the ensemble texture is transparent: each phrase is of modest complexity and is presented plainly so that listeners are able to distinguish each part.
4. The protean mutability of the overall texture strains the limits of musical cognition. The whole is greater than the sum of the parts, so to speak, suggesting realms of reality beyond normal experience.
5. The ensemble's coherence, which derives from interaction among phrases, is always changing. The listener's experience depends on variable factors such as the part or parts that are in attention, the perceived internal structure of beats, and the conception of where the time span's cycle begins and ends.
6. Phrases are designed and played in an open-ended manner that requires listeners to make sense of them. Each part stands alone, yet makes full sense only when the listener combines it with other parts contextualized within the implicit temporal structure.

But what of difference? Art historians tell us that the pioneering Cubist artists like Picasso and Braque intentionally transgressed European cultural norms of painterly visual logic.[64] Since the Renaissance, European painters had developed culturally normative conventions for seeing works of art. Regarding the canvas as a window-on-the-world and reading the painting's foreground-to-background, bottom-to-top

[64] For example, see Antliff and Leighten (2001) or Gray (1953:7).

spatial motion as analogous to the set design of the proscenium stage, painters evolved techniques of realistic representation that were founded on one-point perspective towards a unified vanishing point and a single source of light.[65] Building on the innovations of their immediate predecessors such as Cezanne, subversive artistic rebels in the first decades of the 20th century challenged this artistic status quo by employing an arsenal of techniques including multiple light sources and vanishing points, one-point perspective that projects both forward and backward, layered planes that simultaneously project and flatten space, and the use of heterogeneous and homogeneous space within one work. They were struggling to invent a new visual and plastic culture appropriate to an era of the x-ray, the theory of relativity and psychoanalysis, not to mention mechanized war, mass production and advertising. This self-conscious group of bohemians wanted to express opposition to the barbaric excesses of European imperialism and colonialism in Africa, such as the Congo Free State of Belgium's King Leopold,[66] and to protest class inequality arising from industrial capitalism. Cubist artists wanted to shock the decadent bourgeois art establishment and create a new market for their works.

The African situation is different. What I am calling "musical cubism" in Africa occurs within classical idioms that are fully mature, whereas European visual cubism flowered in a plethora of short-lived, experimental styles.[67] Simultaneous multidimensionality in African music is not an intentional act of rebellion by an in-group vanguard trying to assert a new mode of perception suited to a rapidly changing world. The iridescent equivalence of *Nakohi-waa*, for example, is normative within time-honored Dagomba music culture. Certainly, African music exists within history:[68] creative individuals make new pieces that mark the passing of praiseworthy family members or despised leaders; new genres facilitate the worship of efficacious divinities who are capable of healing or contributing to prosperity; and musical styles change according to events that have impact upon society and culture, such as alliances among African polities, colonialism and globalization. Yet, new music is often structured on the principles of simultaneous multidimensionality and performed in a way that enhances its musical polysemy. Furthermore, the "cubist" style of *responding* to music – whether by listening, dancing or joining in – has enduring efficacy.

African traditional music largely has been free from literacy and its institutions, like art criticism, whose products widely circulate in journalism, books and the academy. African art criticism was more local; detailed discussion of personal style focused on recent history.[69] Dagomba drummers like Alhaji Abubakari, for example, know exactly

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65 Pepe Karmel's discussion of Picasso's technical invention in its historical context is particular cogent among many treatments of this subject (2003).

66 See Hochschild (1998) for a popular expose of this particularly ghastly episode in African history.

67 See Alain Locke (1924:190).

68 Bohannon and Curtin (1995) is an excellent primer on African history and civilization.

69 For discussion of art criticism in traditional African culture, see Thompson (1974) and Crowley (1996).

who started their tradition and can trace precisely the history of repertory and individuals.[70] Stories heard from his elders, as well as his personal experience of musical innovators, enabled him to situate himself within historical time. In dreams, he drummed with his ancestors, received criticism, and learned new drum talks. But this is not equivalent to the capacity of artists in the European tradition to read, for example, Plato's views on aesthetics or the letters of Van Gogh.

Despite these differences in the socio-cultural and historical contexts of their artistic discourses, there are provocative similarities between the style and meaning of African musical works with "cubist" qualities and the worldview, aesthetic response, and purpose intended by European cubist artists.[71] European cubist artists responded to conditions in the world by creating paintings that used techniques of simultaneity to deny the visual certainty of time and place from viewers. The optical cubism of these works evokes the viewer's phenomenal experience of objects from various vantage points, moments in time and affective states. Responding to their somewhat different cultural history in this same world, African musicians composed works that place listeners within a multidimensional temporal condition. African techniques of "sonic cubism" enable people to experience time as a polysemous condition. Cubist artists intentionally deconstructed their subjects in order to draw viewers into the work's community of creation by requiring them to personally make sense of what they see. So too do composers of African traditional music invite listeners to participate in the realization of their musical art for without creative mind–body response the cubist African musical work does not come into being. Some European painters, notably Kandinsky and Mondrian, hoped that their style would be capable of doing mystical, transcendent work appropriate to the new age. Contemplation of visual riddles that are simultaneously affirming and cancelling would direct a viewer's consciousness to a point of transformation. Spiritualism would occur within the process of beholding an artwork whose iridescence, defined as the incomplete synthesis of material reality and pre-existent idea, suggests a higher reality beyond ordinary understanding.

But whereas this sort of "cubist spirituality" was exceptional within a Judeo-Christian society, African cultures take for granted the existence of a complex immaterial world not normally available to sense perception. Simultaneous multidimensionality is typical and normative in African in music and culture. Acting from within this context, creative individuals and communities have developed aesthetically sophisticated artistic works that yield insight into the human condition. Not only clever and beautiful, African "cubist music" provides a potent site for social and spiritual action.

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[70] The website on Dagomba dance-drumming mediates into writing his spoken-word history stories of a representative sample of repertory, as well as the fundamental "talks" for these musical works of dance-drumming (http://Dagomba.uit.tufts.edu).

[71] Thompson asserts that the African performance arts present a comprehensive philosophy of life, equivalent to the system of Descartes; see Thompson (1969).

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Audio examples of *Nakohi-waa* on the Dagomba Dance Drumming website enable users to listen to the individual ensemble parts as single tracks, to chose a combination of parts, and to the whole ensemble in its full multidimensionality. The website also presents Alhaji Abubakari Lunna's vocalized and drummed demonstrations of the parts one-by-one in audio and staff notation. See <https://wikis.uit.tufts.edu/confluence/display/DagombaDanceDrumming/Nakohi-waa>.