

# Temporal Transformations In Cross-Cultural Perspective: Augmentation In Baroque, Carnatic And Balinese Music<sup>1</sup>

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For the contemporary musician in search of a range of structural and cultural connections between different musics, cross-cultural analysis offers many attractive possibilities. Such connections may be hidden among contrasting compositional and performance practices of each music but reveal their similarities at a more abstract level of temporal process. As a disciplinary venture, cross-cultural analysis may help to reconcile music theory and ethnomusicology, while for individuals it may suggest ways to combine, juxtapose, and integrate one's diverse musical perspectives.<sup>2</sup> But comparison across any boundary requires reconsidering basic assumptions so that clear descriptive

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<sup>1</sup> This article in its original form was presented as a keynote lecture to the 8th Congress of the German Society for Music Theory (GMTH), Music Theory and Interdisciplinarity (VIII. Kongress der Gesellschaft für Musiktheorie (GMTH) Musiktheorie als interdisziplinäres Fach) held in Graz, Austria, October 9-12 2008. It was also read to colloquia at University of British Columbia and Florida State University. I am grateful for the generous and helpful critiques received at these presentations, as well as for the supportive and insightful remarks made by an anonymous reader for this journal. The GMTH conference organizers published a slightly different version of this article in the conference proceedings. The citation is M. Tenzer, "Temporal Transformations in Cross-Cultural Perspective: Augmentation in Baroque, Carnatic and Balinese Music" in: *Music Theory and Interdisciplinarity. 8th Congress of the Gesellschaft für Musiktheorie Graz 2008* (musik.theorien der gegenwart Vol. 4), edited by Christian Utz, Saarbruecken: Pfau 2010, pp. 517-530.

<sup>2</sup> Early ethnomusicology—comparative musicology—was explicitly oriented toward cross-cultural analysis. Celebrated works of pre World War II scholars (Ellis 1885 and Sachs 1943 for example) and some who came later (such as Kolinski 1965 and 1973 or Lomax 1976) were concerned with taxonomical approaches to musical elements, styles, and meanings. But such approaches ultimately found disfavor due to a general cultural shift toward relativism and a perceived paucity of culturally valid tools. Since the 1960s ethnomusicology has taken an overwhelmingly culture-specific rather than comparative approach, but at the same time many researchers have become increasingly fluent as performers in multiple traditions. The potential suggested by this evolving state of affairs is both a rationalization and impetus to reconstruct cross-cultural analysis in the light of relativism and cultural specificity, and attempt it anew.

language can emerge and lead not only to new categories of learning, but beyond them to new experiences and construals of music.

In this study I will suggest that studying processes of time transformation cross-culturally can lead to both musical and cultural insights. I will consider how the technique of temporal augmentation interacts with other aspects of musical structure in three works from different cultures: the fugue in C Minor from Book 2 of the *Well Tempered Clavier* (BWV 871; ca. 1740) by J.S. Bach in the European Art music tradition, a *varnam* (a type of concert etude) from the South Indian Carnatic tradition by Manambuchavadi Venkatasubbaiyer called *Jalajaksha*, composed in the 1800s, and the anonymous traditional Balinese dance composition *Baris*, which has an uncertain provenance but is probably more than a century old.<sup>3</sup> The fugue is a keyboard work, the *varnam* a melody with text that can be sung or played instrumentally, while *Baris* is a composition most often played on the *gong kebyar*, a large set of Balinese gamelan instruments. The Bach is fully notated and subject to modest ornamentation in accordance with performance practice. The *varnam* is notated simply with solfège syllables (*swara*) that are intricately ornamented in performance. *Baris* is transmitted orally and subject to variation through preset changes executed by the entire ensemble, and instantiated unpredictably by the dancer's spontaneous cues.

Although I shall ultimately hypothesize that cross-cultural research on musical temporality can affirm some cognitive universals, my purpose is primarily to speak of

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<sup>3</sup> Recordings were the basis for the analyses and transcriptions. The Bach fugue was performed by Glenn Gould, piano (Sony Classical CD 052603). I recorded *Jalajaksha* at a singing lesson in Madras with my teacher Vidya Hari in January 1989, and *Baris* in July of that year in the courtyard of STSI (Sekolah Tinggi Seni Indonesia; the Balinese Arts Academy [now renamed ISI]) with a group comprised of students and faculty led by I Nyoman Windha.

musical structure and process in the examples I have chosen, for specifically musical appreciation and enrichment. I have separate kinds and amounts of insider experiences learning the repertoires under discussion but I cannot compare the selected compositions unless I stand outside of all three and attempt to be fair to them.<sup>4</sup> A kind of neutrality—some might call it cultural grey-out—might be suggested by transcribing all the music into Western notation, as I have done.<sup>5</sup> But this is not what is intended; rather the point is to accept the limitations of the notation technology and combine notation with listening and description in order to analyze and explain. Indeed neutrality is illusory or impossible, but the desire to compare is wholesome. The hope is to apply my expertise in each of these musics astutely, to generate whatever insight the act of comparison may allow. In offering analysis and explanation, I accept the inability to fully suppress any biases the notation and my own training may suggest.

### CONCEPTS AND INITIAL CONSIDERATIONS

Musical structure is formed by interaction between sounding elements, the transformations enacted upon them, and the temporal contexts and dimensions in which they are heard. A musical element is a component such as a melody, a set of durations, or perhaps even a process or concept—whatever is sanctioned and recognized by the culture bearers. The temporal context in which elements exist is generically either measured or unmeasured time, or perhaps some other emergent time framework should the hard

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<sup>4</sup> I have learned and composed European and Balinese music consistently since the 1970s. Although my interest in Carnatic music is abiding I studied its performance directly only for a short period in 1988-89.

<sup>5</sup> This may bring to mind the neutral “trace” postulated in Nattiez’s semiotic tripartition (1990). Notation may suggest such objectification, but it is fallacious to ally the two.

distinction between those two types eventually fail to hold, as some research suggests (Clayton 1996, Widdess 1994). By dimension I mean the scope of the acoustical and temporal contexts an element occupies during its transformations: its number of streams or layers, its overall duration, its density, and so on. *Augmentation* is a temporal process that is part of the larger family of temporal transformations acting upon musical elements. Mainly it is a species of variation, in which an element's identity changes; what is at issue is the nature and degree of the change, and the strategies brought to bear in perceiving the similarities and differences between an element and its transformed version.

Temporal augmentation is thus a transformation acting upon a musical element in a particular temporal context and dimensional state. If we take the word augmentation in its full sense, there are of course many kinds that one could sort into subcategories: incremental ones such as *ritardando* or *rubato*, augmentation acting on part of an object rather than all of it, augmentation at varying rates, etc.—anything that increases duration of part or all of a durational series. In my examples augmentation manifests as the familiar strictly multiplicative increase (by a factor greater than 1). It appears consistently in each of the repertoire items at hand, while elements, temporal contexts, and dimensions all manifest in different ways.

In the fugue the element to be augmented is the set of durations inherent in the melodic pattern we call the fugue subject; in the *varnam* it is that of any or all of the composition's melodic sections; and in the Balinese dance, it is the durations of a melody played in the music's central register that I will refer to with the proper Balinese term *neliti*. In the fugue the durations of the notes of the subject are doubled, and in the

Balinese example the duration of each *neliti* tone is quadrupled. In the *varnam* the melody may appear in three states, the durations among them related by a ratio of 3:4:6.

As for the temporal contexts involved, all of the musics are organized within a framework of evenly spaced pulsations. They are in addition *metric* and *periodic*, and sometimes *cyclic* as well, but in different ways that constrain how the augmentation is perceived. I would like to clearly distinguish among these terms for current purposes. *Meter* is the coordination of two (or more) pulse streams of different speeds related by simple multiplicative ratios, such that all time points in the slower one(s) coincide with time points in the faster one(s). *Periodicity* is recurrence—not just of an abstract or static metric support system but of a rhythmic event or grouping in an analogous metric context. *Cyclicity* is a near-synonym to periodicity, but for the present repertoire I differentiate the two by defining cyclicity as a larger experience of return that synchronizes and resets most or all levels of meter, periodicity, content, and grouping.

Relevant to the analyses are three species of periodicity (Figure 1). In the Bach fugue periodicity is *noncyclic* and *configured*, meaning that while meter is present, periodicity emerges contextually from the actual, constantly changing patterns that Bach composed. These are elements identifiable by culturally aware listeners: the fugue subject and its answer stated at the outset and repeated in numerous transformations of pitch, interval, register, duration, etc., the brief codettas and longer sequences linking appearances of the subject, countermelodies that accompany the subject,<sup>6</sup> as well as conventionalized cadences and all other viable contenders for creating recognizable pattern. Since the patterns are of different durations and identities as well as multiply concurrent and often

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<sup>6</sup> Many fugues have strict countersubjects in polyphony with the subject, but not the one under discussion.

**Figure 1.** Definitions, and temporal contexts in the chosen repertoire

- **Meter:** synchronization of pulse streams
- **Periodicity:** recurrence of a musical element.
- **Cyclicity:** recurrence that resynchronizes/resets two or more levels of meter, periodicity and grouping
- **Configuration:** Periodicity created contextually by the grouping of musical patterns
- **Marking:** Periodicity created by a dedicated sounding (*ie materialized*) or non-sounding (*ie unmaterialized*) stratum

	Metric	Periodic	Cyclic	Marked	Configured
<b>JS Bach, Fugue in Cm WTC2</b>	x	x			x
<b>Varnam: Jalajaksha</b>	x	x	x	unmaterialized	
<b>Balinese Baris</b>	x	x	x	materialized	

desynchronized, the periodicity of the fugue is always in flux, even while the meter is stable. Because the patterns never reset fully for a true cyclic return, the sense of periodicity as recurrence is weak, especially in comparison to the other music under consideration.

In the Balinese piece *Baris*, periodicity is *cyclic*, *punctuated* and *materialized*. *Punctuated* suggests marking the cycle at specific positions with instruments consigned to that special purpose; the cycle is therefore *materialized* by their sounding. The identifying period comprises a succession of 8 pulsations in a repeatable, so-called circular unit. The unit has an identity that is neither as abstract as meter nor as particular as a specific composition. It also has a melody specific to this composition, stratified into intercalated layers. The cycle is materialized by the repetitions of these strata and by the punctuating presence of gongs: the muffled-sounding *kempli* on each beat,<sup>7</sup> the high-pitched *klentong* (or *tong*) at the midpoint, and the large, deep *gong* (the proper Balinese

<sup>7</sup> “Beat” and ‘pulsation” are used synonymously.

term) at the end/beginning point. Each beat is thus materialized by the *kempli*, while the superposition of *gong* at the end/beginning and *klentong* at the midpoint prioritizes those moments over others. Without the different gongs we would determine the periodicity contextually from melodic configuration, as in Bach. Also unlike the fugue, the periodicity does not change and other musical elements must fit to *it*. Transformations applied to drumming patterns, dynamics and other elements must bow to the laws of this strict cyclicity. Virtually all layers of musical content reset with the large *gong*, so cycle, period and meter are coterminous.

In the *varnam Jalajaksha*, periodicity is *punctuated* and *unmaterialized*. The music also has a cyclicity one could call *mixed*, because lines of text and the melodies to which they are set repeat locally, but the music is through-composed at the level of the entire composition. Like the previous example, this music rests on a recurring succession of eight beats, arranged hierarchically and with an independent identity. But this identity is unmaterialized in sonic terms; rather it is expressed visually with chironomy (the hand gestures of Indian *tāla*-keeping). The fact that the punctuation is done non-acoustically demotes it from the status of an actual musical force to that of a measurement device, and may help explain why the music need not hew to the period but may instead veer off from it for quite some distance before returning. When it does return—and it always does, eventually, to a position analogous to that from which it began—the periodicity resets on a larger scale. If text and melody also reset at these points we experience cyclicity. But the cycles are less strongly marked than in the Balinese example, in which content explicitly repeats every eight beats.

## ANALYSES

Arriving now at the analyses themselves, my focus is on how a culturally informed listener perceives the unfolding process of augmentation, and in so doing comes to reevaluate the sense of orientation in the music's time.

### *Fugue in C Minor, The Well Tempered Clavier, Book 2*

Consider the passage extending from a conventional cadential arrival on the dominant harmony, m. 14-21, in which the augmented subject is heard twice—once in the alto voice at measure 14, and later in the bass (see Figure 2(a), an exploded version of the keyboard score with grouping periodicities bracketed and numbered, and Figure 2(b), a schema of these periodicities). The augmentation lasts for eight pulsations, twice the four of the original subject. During the opening exposition, the subject entries and the codetta (also of four pulsations) established four beats as a normative periodicity. This is gradually blurred en route to measure 14, via cadential preparation so tortuous in Bach's idiom that the idea of a second exposition—a common procedure—emerges as the likely candidate for reasserting stability in what follows. Immediately, in the top voice, the subject does return in the tonic key, thus for an instant it seems as though our expectation will be met.

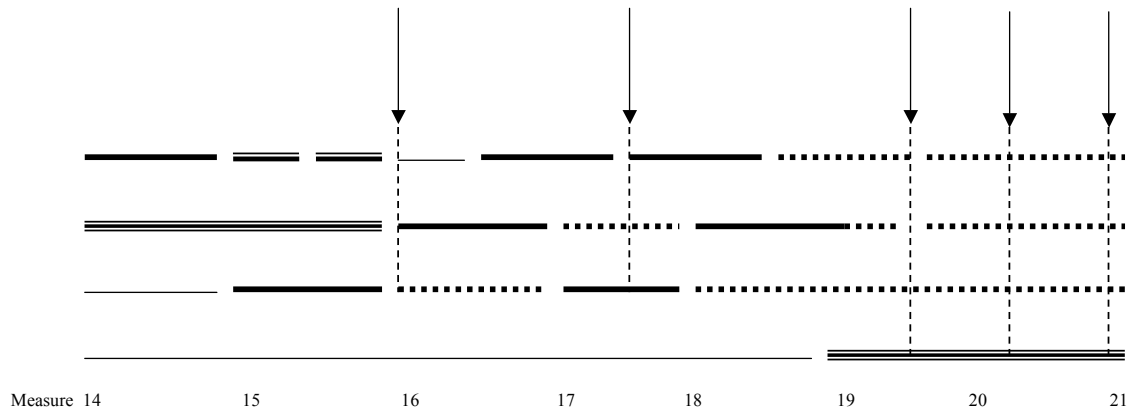
But as soon as the augmented subject begins on beat two, we are fairly sure we will *not* have another exposition, or at least not a conventional one, since the first exposition proceeded so differently. Yet it takes some time to grasp what is in fact happening. By the third notated beat (the second quarter-note of the augmentation) we are sure that it is something new, as no previous secondary voice has ever had this particular rhythm and



**Figure 2(a).** J.S. Bach, Fugue in C Minor BWV 871 (*The Well-Tempered Clavier*, Book 2), mm. 14–21: periodicities, tactus rates, and tonic chord arrivals



**Figure 2(b).** Schema of layered periodicity in the Bach fugue



Legend:

subject **————** augmented subject **=====** sequential material **=====**  
 “free” material **.....** rest **——**

***Audio Example 1: Bach, Fugue in C minor from WTC 2, Exposition followed by the passage discussed (Glenn Gould, piano)***

contour. It is not until the fourth notated beat of the measure that we have three full quarter notes of the augmentation, giving us at last the necessary and sufficient information—because of the emerging duration and contour profile—to realize that an augmentation is unfolding. At this point we must think backwards to revise our projection of the operative periodicity from four pulsations to eight. And because the tactus is part and parcel of the subject's construction, we must also now reset the tactus rate. In other words, if we want to grasp the identity of the subject at this slower speed at this moment we are impelled to refocus our perception of the tactus to half its prior rate, and to rehear the ordinary statement of the subject in the upper voice as a diminution, rather than a normative flow. We have to work hard to go back in time, in order to slow down time.

We are released from this slow-motion at the end of the augmented subject, which closes with a strong dominant-to-tonic progression. The soundscape re-shifts, and we re-entrain to the prior tactus. Thoughts of a second exposition briefly return when the same voice continues on to give the subject's answer in its standard rhythm. But now, when the soprano and tenor voices respond with stretto at two-beat intervals, the periodicity is blurred again. The upper two voices continue the stretto for one more time each, keeping the periodicity overlapped and suppressing coordinated articulations among the voices. As the music progresses and Bach fleshes out the motivic connecting tissue, longer overlapped periodicities of 6 and 12 beats emerge in the upper voices, generating additional complexity. When the augmented subject arrives in the lowest voice a quasi-stable inverted tonic comes at its second note (the middle of m. 19), creating an ambiguous and seemingly misaligned sense of arrival. And because the end of the augmented subject on the first beat of m. 21 is similarly weak, the root position

dominant-tonic cadence at beats 1–2 of m. 20 (the subject’s fourth and fifth notes) feels stronger in retrospect, though not where it “ought to be” with respect to the structure. This series of varied tonic chords does not weaken the augmentation’s 8-beat periodicity, but the 2+3+3 grouping occasioned by the harmony recasts its orientation with regard to both the other voices and its own internal tendencies.

Augmentation in this fugue is heard first as a doubling of duration in direct juxtaposition with a normative periodicity, and then again later, detached from the normative, to bring order to a complexity in which the individual voices’ periodicities neither align nor exert control. It is powerful both in its ability to regulate multiple strands of time, and in the demands it places on our perceptions to reevaluate time and enrich our grasp of it.

### *Jalajaksha*

Augmentation in *Jalajaksha* is an optional part of the performance practice that is not built into the composition. South Indian *varnam* are composed melodies set in given *rāga* and *tāla*, often sung or played at the beginning of a performance. They generally have a bipartite structure, each part of which has subsections. The first opens with the setting of two poetic couplets (the *pallavi* and *anupallavi*), followed by *sargam*, in which solfège syllables are themselves sung (*mukthayiswaram*). In the second part one or several lines of text are set (the *caranam*), followed by more composed solfège (the *cittaswaram*). The *sargam* melodies may use complex motifs that often make them sound as if they are improvised, but they are not—they are planned out just like the rest. As indicated earlier,

some text lines may be immediately repeated with the same melody, creating local periodicity.

*Jalajaksha* uses the 5-tone *Hamsadvani rāga* (CDEGB). It is set in *adi tāla*, in which 8 beats are counted 4+2+2 using a 4-beat *laghu* gesture (a light hand clap followed by the right thumb touching three fingers starting from the pinky) and then two 2-beat *dhrutam* (down-up hand waves). In Figure 3(a)'s transcription I remove the singer's pitch and rhythmic embellishment of the essential composed melody, and show the *tāla* gestures below the top staff using whole and half- notes for the downward hand claps and waves, and stemless black noteheads for the less important finger counts and upward waves.

The top staff of Figure 3(a) and the top row of Figure 3(b) show three *tāla* periods (“measures of 8/4”) of *Jalajaksha*, as sung in its ordinary duple subdivision setting. Once the performer sings it this way, it is often then resung at double the rate—i.e., in diminution to quadruple subdivision—and then a third time at two-thirds the rate of the diminution, thus augmented to ternary subdivision.<sup>8</sup> Hence the ratio of 3:4:6 I mentioned earlier should actually be 6:3:4, reflecting the order of appearance. The systems and rows in the Figures are vertically aligned to show that what filled three *tāla* in the duple setting fills one-and-a-half *tāla* in the middle system's quadruple setting, and two *tāla* in the ternary setting shown at the bottom. Hypothetical “sped-up” *tāla* gestures are given below each staff for reference, but in practice the tempo and the *tāla* gestures do not change, remaining as they were for the original version.

This is a standard technique in Indian music, but what is its effect? The music begins with two synchronized periodicities: one given by the *tāla* gestures, the other emergent

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<sup>8</sup> The first operation is thus a multiplication by .5, and the second a multiplication by 1.333.

**Figure 3(a).** Varnam *Jalajaksha*, pallavi section, showing the *tāla* gestures and alignments between different versions

Hamsadhvani Raga (CDEGB)  
Adi (4+2+2) tala

Composer: Manambuchavadi Venkatasubbair

**Pallavi**

1.Ja la ja ksha ni ane da bu si 2.Cha la na ru lu 3.Cha li ya ne la ja va de mira

(Anupallavi)

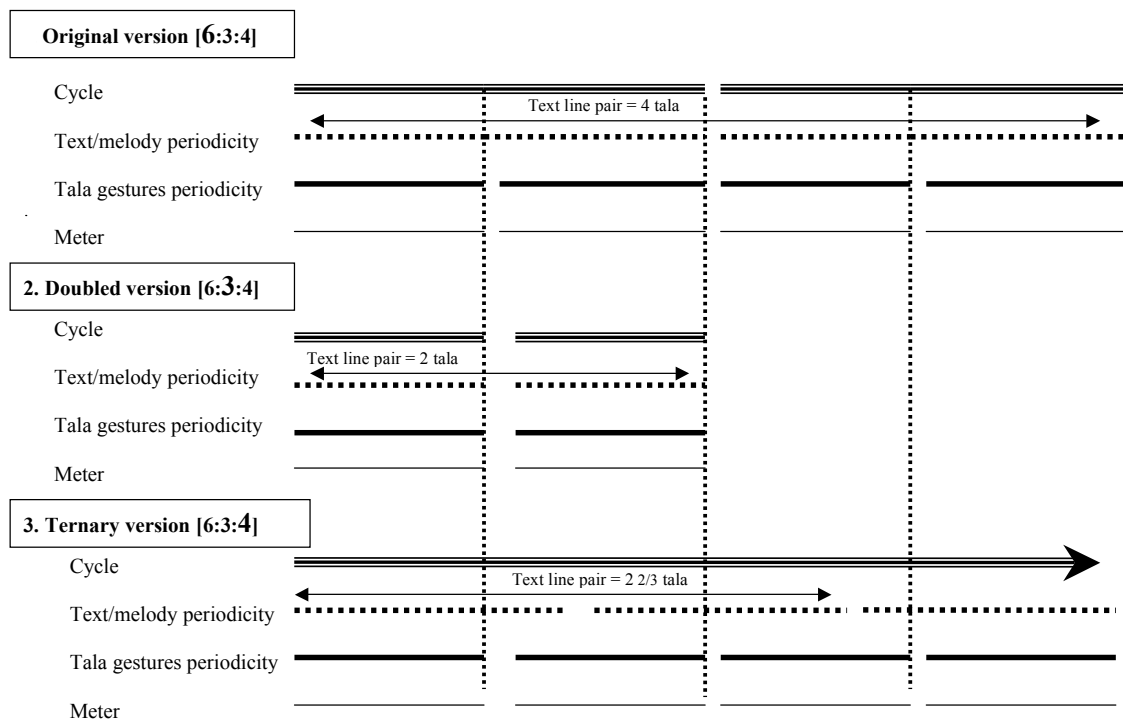
Tala, as gestured throughout (all tones indicate one beat of value; whole and half-notes show beats emphasized by hand gestures)

Tala, "as if" for doubled version (shown for reference only)

Tala, "as if" for ternary version (shown for reference only)

Text (in Telugu):  
O lotus-eyed one, this Devadasi is intensely in love with you.  
To protect your companion, aren't you coming?  
O handsome Venkatesa!

**Figure 3(b).** Schematic representation of periodicities in *Jalajaksha*



**Audio Example 2:** The pallavi of *Jalajaksha* at three speeds (Vidya Hari, singer)

from the alignment of text, melody and *tāla*. The *tāla* has a dual role: it marks a neutral pulse stream on which *anything* can be overlaid, while its hand gestures provide an inviolate timespan that resets every eight beats, *no matter what* is overlaid. The periodicity of the text/melody combination is heard in terms how it aligns with the *tāla*. At the beginning of *Jalajaksha* this alignment is simple: each line of text fills exactly two *tāla*. The top staff of Figure 3(a) shows the *pallavi*'s first text line (*Ja...si*) unfolding over this two-*tāla* span, plus, in a third *tāla*, the first half of the second text line (*Cha...lu*). In the quadruple version there is a new line of text at the onset of every *tāla* instead of every other *tāla*, so we hear three full lines of text (including the first line of the *anupallavi*) in three *tāla*.

When the subdivision rate changes to a ternary one that is numerically out of synch, text and melody decouple from the *tāla*. Only when all of the levels realign would we speak of a true cycle. The text unfolding over a single *tāla* period in the original version lasts for two thirds of a *tāla* in the ternary version; the full line sung over two *tāla* in the original version lasts for one and one third *tāla*; and the entire *pallavi* text couplet lasts two and two thirds *tāla*. Three couplets would have to go by, lasting  $(2\frac{2}{3} \times 3 =) 8$  *tāla* all together, before a full realignment. Because of how this particular song unfolds, this moment only arrives even farther down the line, after allowable adjustments in the form of extra text/melody repetitions are made.

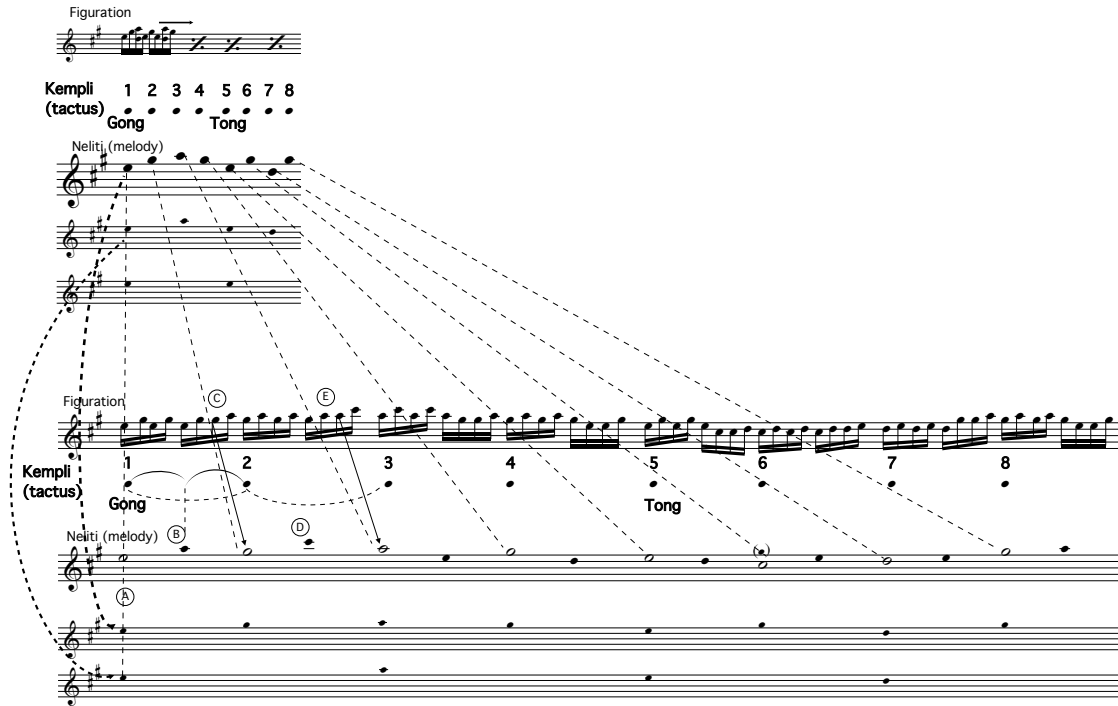
Unlike the introduction of the augmented subject in Bach's fugue, the moment of transition to ternary in *Jalajaksha* can be anticipated. Although it is the performer's choice, we know it is an option within the performance tradition and we hope that this demonstration of skill will arrive to impress us. If the tempo is not too fast, we should

know by the second note that the tense complexity of ternary subdivision is in effect, and this requires us, as in the case of Bach's fugue, to retrospectively interpret what we have heard. But now we must brace ourselves to manage the multiple, asymmetrically related strata all the way until the distant cyclic arrival. During this time we must internally reconcile every note in the song with its new home in a new landscape of subdivisions. Most tones that were commetric now becomes contrametric, and vice versa. To stay with the music we are forced to manage two time flows at once.

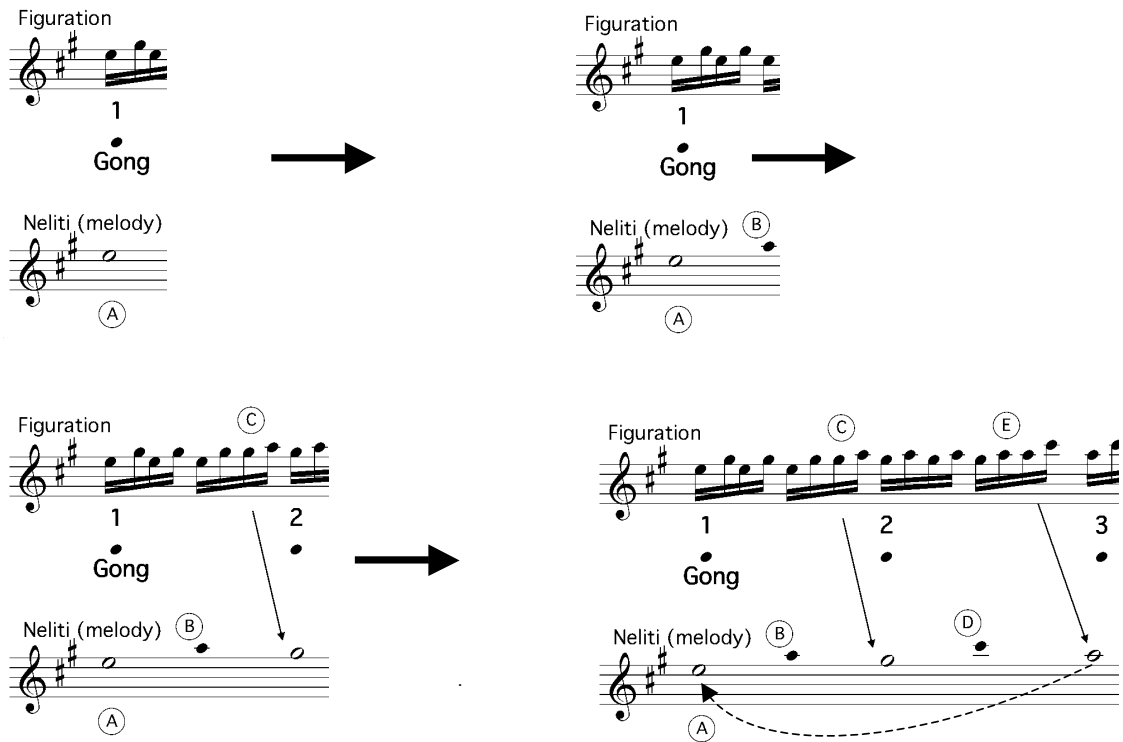
### *Baris*

The *Baris* dance and its ostinato-based music are canonical in Balinese *gamelan*. Here we are concerned with the central portion of the dance, which is based on a melody of 8 tones (Figure 4(a)). As mentioned earlier, this stratum of the structure is called *neliti* in Balinese. These tones, and the small gong *kempli* coinciding with each of them, provide a tactus at the fast tempo but are too slow to be perceived that way in the augmented version. Every eight beats nearly everything resets, marking a single unit of meter, period and cycle. In the recording the *neliti* is played first very fast in the beginning, at an average rate of  $\downarrow = 180$  (about 2.75 seconds per cycle) for 17 repetitions. It is then heard seven times in augmentation at about one quarter of the tempo, i.e.  $\downarrow = 45$ , then again at the original tempo for 19 times. In each case numerous variations in drumming, surface phrasing, and dance movement are overlaid. The tempi constantly fluctuate, especially in the slow section, according to the dance's movement vocabulary. But the *neliti* continuity is unbroken throughout.

**Figure 4(a).** Structural transcription of the augmentation process in *Baris* showing tactus rates and melodic strata



**Figure 4(b).** Stages in the perception of augmentation in *Baris*





**Audio Example 3: The central section of the Baris dance at two speeds (gamelan of the STSI conservatory, Denpasar, Bali)**

The *neliti*'s most important note is the one coinciding with the large *gong* stroke, shown here as the pitch E. The same tone arrives with the *tong*, or small *gong*. These two E's are also played by a prominent, sustaining bass instrument, giving the melody—especially when it is fast—the quality of a drone due to the recurring emphasis on this pitch. At the fast tempo we follow the contour of the *neliti*'s other notes: up, then back to the origin in the first half; then up, down below the origin, and back in the second half. The fast figuration pattern is two beats long and thrice repeated to fill the period, returning always to the E every other beat and in-between as well: an extension of the drone.

At the slow tempo the drone notes at the beginning/end and the middle of the cycle are separated by almost eight seconds, which is longer than the window of the psychological present.<sup>9</sup> Thus the character changes completely. The *neliti* is filled out with a new tone interpolated between each of the original ones, and this new 16-note melody is felt as the tactus, still only half as fast as the previous tactus. The figuration patterns, too, change style in order to follow the original *neliti*, which now descends one level through the *gamelan*'s orchestration to an instrument in the next-lower register. The eight-beat cycle is still maintained by the muffled *kempli*, but its attacks are almost 2 seconds apart, too slow to be felt as tactus anymore.

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<sup>9</sup> See London (2004, 30).

The five points A through E in Figure 4(b) represent stages in a culturally aware listener's growing perception that augmentation is occurring. At A we hear the *gong*, and immediately afterwards derive the new tempo from the characteristic quadruple subdivision of the figuration style. At B, a new note in the *neliti* stratum not present earlier tells us ambiguously that we *could* have a new melody on our hands. The repeated G# at C is a stylistic mark of the figuration heralding the *neliti's* arrival on that same pitch at the next beat. This is the third tone of the expanded 16-tone *neliti*, but the second tone of the original 8-tone *neliti*. What is going on? Knowing the style might lead one to suspect an augmentation in process, but it cannot be confirmed because we have only heard two pitches of the original melody, which is insufficient. Points D and E replicate the roles of points B and C, confirming the arrival of the third original *neliti* tone. By this point we are quite sure, so we project *backward* to B and D, as we did in both the *varnam* and the fugue, in this case understanding the tones there as interpolations filling in the expanded space between the tones of the original melody.

From this point on, with a mental representation of the original *neliti* to guide us, navigating the slow tempo is possible. It is nonetheless an experience of abstraction requiring several kinds of simultaneous awareness, because the fourfold temporal expansion consigns the original melody to a background realm where it acquires an audible but, because of the augmentation, a rather more structural, and less immediately tactile quality.

## COMPARISONS

At the beginning of *The Time of Music*, Jonathan Kramer quoted Artificial Intelligence pioneer Marvin Minsky's speculation that music was a form of "play" through which we learn about the world. Minsky mused: "how does one learn time? Can one time fit inside another, can two of them go side by side? In Music we find out!" (Minsky 1982: 4-5 in Kramer 1988:1). The preceding analyses conclude that in each of these cultural contexts, augmentation "plays" with time by stretching it out, but also by juxtaposing and alternating it with other kinds of time, making us sustain awareness of multiple strata. Though related simply, such pairs of strata literally force us to engage with time as an abstraction.

In all the above cases a musical element—a melody—maintains a clear identity. We recognize it faithfully despite changes imposed on it, including coming to terms with its specifically temporal transformations. We hear two kinds of time at once, and must travel through time at two speeds at once. Our own memory allows us to do this even when we dream or daydream normally, but music gives this capacity rigorous quantitative organization. We thus experience our minds with uncommon precision. It is of interest that in Bach's style augmentation often occurs at moments of climax or peak complexity, as if through the ears of a meta-protagonist who imposes a special clarity from without. The moment of augmentation is often a goal of the individual composition, while the clarity it confers is a goal of musical perception itself: a heightened, perhaps even spiritual stepping-away from ordinary ego-centered awareness. This is equally true in South India, where mastery of augmentation and diminution proportions over unchanging *tāla* is a potent marker of discipline and advancement. In Bali, augmentations occur, as in

*Baris*, embedded in the center of extended compositions, especially those performed at rituals in a temple's *sanctum sanctorum*. Such compositions attain high levels of abstraction, which is why they have particularly strong associations with the sacred. When Balinese hear them they may feel transported to a numinous realm. That these closely related associations hold in all of these musics points to the existence of a common landscape of musical consciousness, where it is possible and desirable to learn how thoroughly our mundane conception of self depends on our ordinary experience of time. At the moment of augmentation, dwelling in two times at once, we become someone else, someone perhaps wiser and more aware.

Underpinning the analyses and structuring their compatibility are the notions that meter, memory, and perception are as universally fundamental to preparing a musical phrase as a pot, flame, and water are to cooking a German *goulash*, Indian curry, or Indonesian *gulé*. Focus on time and periodicity abstracts a higher level of relevance in relation to which musical and cultural particularities such as pitch system appear to be lower. This is as if, in a recipe, one declared that a liquid base is what chefs everywhere need to flavor a stew, and that the choice of wine, buttermilk or coconut milk is a secondary concern. To suggest that time is music's "liquid base" is not to say that pitch systems or compositional strategies are anything but fundamental to musical experience, especially in light of their total integration with cultural practices and the expertise needed to assimilate or reproduce them. But if humans are all equipped to grasp pulsation and tactus, to predict future events and recall earlier ones, and to quantize time relationships at multiple levels, then it is neither an accident that we should be able to hear augmentations across cultures in meaningful ways, nor that each of these cultures

apparently discovered and value the technique independently of one another. Though we hear these temporal transformations as culturally distinctive, the states of mind they engender are importantly similar because they grant access to a distinct musical perception that is supraculturally grounded.

## ISSUES AND DEBATES

A growing number of publications have appeared applying theories of rhythm and meter to African and Indian Music (Temperley 2003, Arom 1991), contour theory to Balinese and Indian music (Tenzer 2000, Clayton 2000, Morris 2006), and more. This is not the forum to summarize or survey these; I mention them only to emphasize that there is reason for optimism about cross-cultural comparison's prospects. I think it will be meaningful for the education of future musicians. It can however feel regrettable that all of this comparative scholarship is by scholars working in Western academe, for thick historical and social reasons that inevitably raise questions of power and authority on the one hand, and motivation or interest on the other.

To many ethnomusicologists, moreover, this venture remains fraught because it overlooks indigenous ways of knowing. Counter-hegemonies are what we should be promoting, and instead of building our own synthetic apparatus we should concentrate on fostering understanding of musicians everywhere who have far more trying issues than what kinds of music analysis to do. Why even have cross-cultural discourse on music analysis if it is only for one small part of the world to use, or should one say wield? There is no reason to argue against these eloquent concerns to strengthen and raise

consciousness about the precious individualities of all musics, the belief systems behind them, and the empowerment of the musicians who transmit them.

But waiting for all systems to be go, for a world in which there is consensus and power sharing across the board, is a recipe for inaction. Moreover the stalemate would appear to be between anachronistically framed conceptions of putatively opposing social formations: indigenous cultures and western academe. But there is really only one social category pertinent to this venture: the contemporary cosmopolitan musician. Such musicians, wishing to move from inaction to action, should apprehend different musics in terms of their cultural significance to a responsible extent. This must be reconciled with the irresistible challenge to grasp musical diversity with one's own ears in one's own way, based on as much research and apprenticeship as life permits, and with the hope that one's analytical discoveries and displays shall in time be validated through dialogue and debate.<sup>10</sup>

How, indeed, can I vouch for the salience of the foregoing analyses? There is really only one, rather painfully obvious way: because I submit that I have enough experience with each music to assert some cultural relevance in each case, to have been sufficiently sensitive to insider knowledge to be able to claim the benefits of detaching and examining these issues both apart and together. It is equally obvious—yet to me surprising and remarkable—that in doing these analyses I did not *feel* as though I was

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<sup>10</sup> Another option is to renounce the paradigm of analysis as creative act of discovery in favor of a classic structuralist procedure. This entails rigorous formulation of universal musicological categories (such as identifying generic types of time and pitch organization, etc.) and the refusal to allow the specificity of different musics and musical perceptions to dislodge them. Such specific perceptions, on the other hand, would be admissible only to the extent that they can be confirmed either directly or experimentally by the culture bearers. The analyst's subjective experience becomes essentially irrelevant. This is the approach taken by Arom (1991 and other works).

crossing any boundaries. These were three musics, but I am only one analyst, and one mind. The analyses will be convincing to the extent that the expertise behind them is credible. Yet even if their internal arguments are sound (and I hope they are), a reader without expertise would be in no position to confirm their salience. Readers must proceed on faith to a certain extent, and accept that the more one knows the culture the more one can critique the analysis.

It may seem like a cop-out to offer a supposedly cross-cultural system only to devolve back to the trump card of cultural specificity and insider knowledge. However I think this is not only inevitable but desirable, and it reflects how complex and irrational insider/outsider relations are. The process of filling in all the cultural gaps so that we can at some point have the broadest possible analytical perspective on music will be long, slow, imperfect, and depend on more and more thinkers with cross-cultural experience taking an interest in the venture. It would be marvelous if this was not a disciplinary or ideological journey, since neither music theory alone, nor cognition, nor anthropology nor any other culturally-oriented humanism, will get us where we want to go by itself, and the frameworks separating these fields will increasingly cease to reflect the boundaries of people's interests and desires.

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