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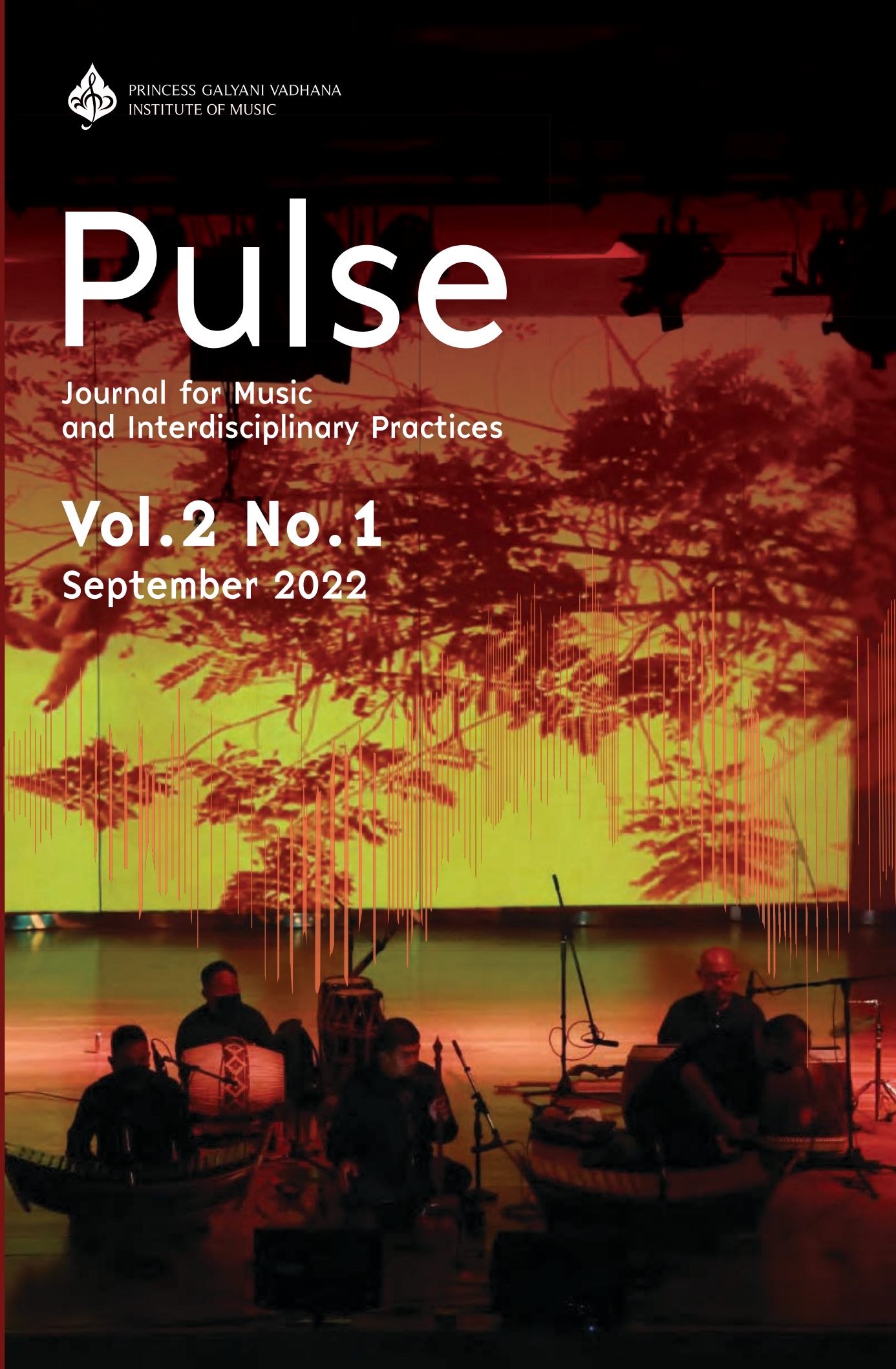

Jamming: How Traffic and Javanese Gamelan Improvisation Music Works

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Introduction

In over forty years of studying to fathom the music of classical Central Javanese music - by applying my Western training- I have found that the precision in the West which is associated with scientifically measurable exactitude is not something which is aesthetically - or perhaps even possibly- desirable in Javanese music or culture. While a Western approach is to look for operational principles and the consistent application or repeatable evidence of some underlying principles, Javanese gamelan does not seem to have this type of consistency or systematic regularity.

In this paper, I will analogize how traffic jams can explain musical improvisation (jamming). For long, I have noticed the way cars, motorcycles, bicycles, and pedestrians negotiate traffic in a Javanese street. Watching street traffic, I see that individuality, togetherness, freedom to improvise (going against traffic), and unspoken signals parallel the way in which musicians interact during music-making. I will mention some well-known gamelan theory and terminology such as *gatra, cèngkok, wilet, sèlèh,* and *plèsèdan* to show how street traffic helps me to play music better. A more detailed examination with musical examples will be made available in a future paper. This paper aims to present, at a high level, an attitude of self-discovery for non-Javanese to consider when playing Javanese gamelan music.

My observations of Javanese musical interactions will produce somewhat tongue-in-cheek ironic jest "principles" such as Principle of Flow, Principle of Go Together, or Principle of Inconsistency. I am not proposing a framework for intellectual discourse. Probably no Javanese musician would recognize or be aware (or care) of these so-called principles. Here, my jests are to point to the importance of *rasa* (feeling) and *enak* (tasting good) in Javanese classical gamelan musical practice.

How I Started

Following Hood's concept of bi-musicality of play-as-research and research-as-play, I am a prototype extreme ethnomusicology practitioner. I have had the great fortune to play-research in Jogja and Solo continuously since 1992. I do not have to come to Java for fieldwork. I live in the field. At my teacher Pak Cokro's house in Jogja where I have lived since 1992, there were regular rehearsals. The best RRI national radio and Paku Alaman palace players came every Tuesday night to play the more esoteric compositions. When I practiced *rebab* (Javanese two-string spiked fiddle) and *gendèr* (a metallophone played with two hands) late into the night, Pak was sleeping in the next room, and in the morning, he would comment on my progress. In Solo, I lived in the house of *dhalang* (shadow theater master) Anom Suroto's house, and followed him to rehearsals and all-night shadow plays. In the afternoons, I joined the Mangkunegaran Palace practices, and in the evenings, I could rehearse with expert players from the high school (SMKI, previously Konservatori Karawitan Indonesia) and university of arts (then ASKI, then STSI, now ISI), and the RRI radio station. I have played with and learned from a gamut of experienced players and teachers.

With full-time research, I reached a conundrum of whether I could ever play gamelan "Javanese" to a level like Asian classical musicians have achieved in performing Bach, Beethoven, or Bartok et al. After I learn all the melodic patterns (cèngkok) and the way they are put together, and I can play a number of pieces, then what? While the Asian player has the advantage of finding scores, notations, and many excellent recordings, I did not have that canon of Javanese gamelan.

Therefore I, as also many other foreigner students did, recorded as much as possible, got data; transcribed; deconstructed; found parallels; made things fit to my own understanding. But, even if I could record the same musician playing the same compositions over a long period of time (which I did), would I understand what I desired? I achieved a certain level of technical skill, but the question is do I really play "Javanese"? Can I learn another person's culture? How would I know that it is achieved ?

A Sidetrack

In 1976 I was on a visa break in Singapore— a different time when the divide of cultures was much wider than the current compression of the internet and globalization. The background music at the lunch place was a song by the famous rock band Fleetwood Mac. I was comforted after a year of intense Javanese and Indonesian musical fare. But, something was amiss. It turned out to be an Asian copycat band. Feeling both delight and discomfort, I appreciated the copycat band's love of the music, but also could not bear to hear the misunderstood feeling and flow of the song. The copycat had all of the notes correctly. I am sure they had—as I do with notations of my teachers—faithfully dissected and memorized every note of Fleetwood Mac's recording. But something essential was missing. I suspect that my study of Javanese music lacks this same. But how would I know?

What kind of investigation opens the door to understanding what even the most humble Javanese gamelan player knows, but which I in the West do not know? Most if not all of the gamelan musicology literature is systematic-oriented, scientific-oriented. Western music, often, cherishes and respects technical skill, virtuosity, and regularity. Being from the West, my efforts have been biased to the intellectual and scientific, theoretic and rational.

I had studied the canon of gamelan, poring over the notations of rebab of Jumadi and the gendèr encyclopedia of Martopangrawit, and discussing with other American students about stereotypical melodies – *putut gelut, ayu kuning, debyang-debyung*, and *kacaryan*—to find out how it all fits together with the theories of Hood, Becker, and Sumarsam.

I have followed the river and the current of the developments of gamelanology such as “nuclear theme”, “inner melody”, and “gatra” (four-beat unit of music) with some suspicion although these concepts have certainly been helpful in contextualizing and giving a framework from which to study. But have I studied the correct things?

The bulk of “ology” of gamelan has been a particular way, and its influence has been aptly summarized by Sumarsam in chapter three The Impact of Western Thought on Javanese Music in “Gamelan: Cultural Interaction and Musical Development in Central Java”. “The impact of Western Thought on Javanese views of music evidences the concentration on a certain focus which is intellectual rather than instinctive.”

This impact has been my own making. Because Martopangrawit stands out from other gamelan musicians for being able to articulate things in a way which the western mind understands certain things quickly, perhaps the writings of an instinctive master—as he certainly was— has received overemphasis on something which he may have not wished for students!

Fortunately, I was able to meet someone who was also much revered by the western students and was at the same level of proficiency and teaching capability as Martopangrawit.

Don’t Too Much Teori!

Pak Cokro (Wasitodiningrat aka Wasitodipuro aka Notoprojo) taught in America for over 22 years. I first studied with him in 1972 with vocal lessons, but only for summer programs. It was only in 1992 when I started living with him in Java that I started to concentrate on his gendèran and rebab (two advanced instruments in the gamelan orchestra). After living with Pak for a few years (where I had the unprecedented fortune of study, with him advising, prodding, pointing me day and night), I realized that he rarely mentioned any terminology. His teaching approach was quite different from all gamelan that I had learned.

He always said that the important thing was "*pengalaman*" (experience). When he knew that I had studied the advanced instruments like gendèr or rebab, and had learned enough cèngkok (musical patterns) and compositions, he frequently said that I should make variations. Early during his time in America when we students were so thirsty to understand gamelan, and when our western mind would ask one question after another, he patiently explained and played or sang examples. Finally, he said "*Don't too much teori*". Don't think too much. Understand by playing. Even during the fifteen years when I had his highest attention, at most, he said knowing high and low notes was important. "*Make variations, be free, and know the vocal*".

Traffic Jam

This is how I have noticed the way cars, motorcycles, bicycles, and pedestrians negotiate traffic in Java. When a motorcyclist enters the main street, he (usually it is male) whizzes in without looking first to see if anyone was already on the main street. At a red light, it is not certain that drivers will stop. At a famous intersection in Solo, because it is a T-intersection, all drivers whizz straight through. Maybe it is okay for drivers on the straightway part of the T-intersection, but a few years ago, the city planners opened up the T into a regular four-way intersection. Drivers still whizz right through!

When people cross a busy street, they take what seems like terrible chances, sometimes ending up momentarily stranded in the middle of the road with vehicles whizzing by on both sides. Mothers foolishly (in my eyes) end up with small children by hand. It is likely while the mother is waiting, people may have joined in, all of them slowly sneaking ahead.

At busy intersections, a driver is forced to wait for the traffic passing by in front in order to get across it before making a right turn (in Indonesia, the traffic is the "opposite side" of the American way). But, just like pedestrians waiting, they each slowly creep ahead, sneaking their way into the crossing lane, until the drivers on the main road are forced to give way.

If the driver is impatient to wait, instead of sneaking to force the right-left drivers to give way, he might turn on the immediate near side of the traffic, going opposite the traffic, thus creating a three-lane street! Eventually, he will find a free space to go across to the correct lane.

Even when traveling in the direction of the main traffic, drivers will pass each other, either on the left or the right of the others. (In America, drivers should only pass on the left of the driver ahead.) Drivers will weave in and out, getting any small advantage of a few feet ahead. No one likes to stop or wait.

In the over twenty years that I have driven in this madness, I rarely have seen accidents. So it must not be madness. It is just that I don't understand the principles although I have negotiated them well—just like I have reached a certain level of competence in gamelan playing, but I do not fully understand the principles of gamelan.

The principles of traffic are: each person looks out for himself, but is aware of the others; people will cross together, but all working independently; no one wants to be left behind alone; but no one wants to start out and be the only one crossing either.

This is the Principle of Flow. Don't stop, keep going ahead, don't get too far ahead, and don't be left behind. The smaller vehicles move faster and can go here and there freely. The bigger and heavier vehicles must be given the right of way. Importantly, "Don't Look Back". In Indonesian law, if a vehicle hits another, it is the one behind who is wrong. The person behind must watch for what is in front no matter what the one in front does, whether weaving here and there, or suddenly stopping.

In gamelan, what musicians do not like is stopping. That is the Principle of Keep Going Forward. In music, if western classical players lose their place, they would stop until re-synchronized, but a Javanese player might float around, noodling, hanging around while playing something—anything—until they reach the sèlèh (cadence). This is called "*ngawur*". Ngawur can be a pejorative term to

describe that a musician doesn't know what he is doing (which could be true). But ngawur can also describe a positive attitude that says, "Let me figure this out. It is more important to keep the sound going rather than having a gap." This is Flow.

A corollary to the Principle of Flow is the Principle of Go Together. This is a strong cultural instinctual behavior: Never Go Alone. How many times have I shown up at an event in Java where friends will ask "whom did you come with?" As an American, we go places alone. We are individuals. My frequent answer of "I came alone" still (although they have known me for so many years) results in surprise or confusion. No one goes alone; unless there is something wrong, or secretive. When musicians come to Pak Cokro's regular 35-day *wiyosan* (Javanese traditional birthday), even though they have been coming there for twenty years, if they have come alone, they will wait outside the gate until someone else shows up.

The Principle of Santai

Closely related to the Principle of Flow is the Principle of Santai. *Santai* means to do things easily, relaxed. If I struggle when working on some difficulty in my gamelan technique, I am probably doing it wrongly. The Principle of Santai says that it should be done with as little effort, physically and mentally, as possible. One never sees a Javanese musician grimacing in intense concentration the way Western musicians might.

There are many ways to see this concept of santai at work. I was watching the blind palace musician, Pak Karno, hold the gendèr *tabuh* (mallets). His hands were very loose and the tabuh seemed to float lightly. I recall when I and other Americans first learned, it was a struggle to find a comfortable hand position. Damping and the twisting and rotating of the wrists was a challenge and I often found myself (and I have heard many other foreigner students) banging rather forcefully and loudly on the keys. Blind Karno seemed to not even touch the keys.

The Principle of Own Way

Another problem for foreigners is learning the rebab (fiddle), perhaps the premier instrument in classical pieces. I used to get cramps on my left hand (the hand which does the fingering). Later, I noticed that each Javanese player had their own way of fingering.

Regardless of short, long, fat, or thin fingers, each player finds their own comfortable way to play. There is no special attention by teachers of the "correct" way to hold the bow or to finger the notes. Players usually do not play with the tips of their fingers as often (mistakenly) happens with Western rebab students who are perhaps accustomed to (and maybe entrapped by) violin or guitar technique, but use a variety of touch including the sides of the fingers and the soft flesh of the joints. Some players seem to just slap their fingers haphazardly (but of course it is not). This individual way of fingering and bowing results in a wide variety of "voices". The same instrument can sound totally different when played by several musicians. This is due to the Principle of Santai, and the Principle of Own Way.

The Principle of Enak

Besides the Principles of Santai and Own Way, the Principle of Enak is important. The word "enak" means good tasting or delicious. This word connects closely with "rasa" which means "taste" or "feel" or "feeling". In music (at least in Solo; Jogja may be another matter), new arrangements, improvisations (as on the gendèr or *gambang* (wooden xylophone)), or variations in melodic invention (as by the rebab player or *pesindhèn* (female solo singer)) are judged not so much by technical rules or considerations but by whether it is "enak"—tastes good, delicious, or feels good.

The late American composer Richard Teitelbaum, who early in his career studied Javanese gamelan, recalls Pak Prawoto, the resident teacher at Wesleyan at the time, teaching students how to play the gong, a seemingly simple instrument which is sounded only once at the end of each compositional cycle (typically once every 16 or 32 beats for the short pieces). He said "*make feel good*".

The Art of the "Simple" Instruments

During my first lessons on gamelan, I viewed the so-called colotomic instruments—the *kenong, kethuk,* and the *kempul*—as somewhat elementary instruments to be theoretically understood, tried a few times before moving on to the melodically more interesting *sarons* (xylophone-like metallophone) and *bonang* (horizontal kettle-shaped instrument). I was surprised when Pak Cokro said he knew a Javanese musician who was one of the best kenong players.

It was a wonder to understand how such a simple instrument which displayed no discernible melodies—primarily a percussion instrument (and very minimalist at that!)—could require expertise. The simple kenong marks major phrases or sub-phrases of the gong cycle and indicates and strengthens certain melodic movements (such as plèsèdan). If the kenong sounds the wrong note, other musicians may be misled about where the melody is going. Or worse, because some compositions share or have similar elemental phrases (i.e., 5653 2165 followed by 22.. or not), playing the wrong kenong note may lead musicians to play a different composition. Never mind that if the kenong sounds on the wrong beat, it would certainly confuse the musicians. At the very least, it would create disharmony in the musical flow. So, the kenong player must know many pieces and be sure of the formal structure.

Having finally learned to respect the kenong player for his breadth of knowledge, I was still surprised when Ibu Tugini, one of the top pesindhèn (female singer), recounted how one day she was entranced by the harmoniousness of the kenong playing. The touch and timing was so good (she said "enak"—there again is the importance of rasa). She wondered who made such a beautiful sound. It was Pak Wahyo, the well-known rebab and gendèr expert. She said that Pak Wahyo was such a feelingful musician that even when he played the simple kenong, there was something special and extra beautiful about it.

The Principle of Inconsistency

While the Western approach is to look for operational principles and their consistent application, or the consistent repeatable evidence of some underlying

principles, Javanese gamelan does not seem to have this same consistency (although it may be a matter of degree). For instance, the pesindhèn theory (such as it exists) for the female vocalist is not comprehensive. It does not address the fact that sometimes a counterpoint arises where she might go high while the rebab and gendèr go low. The theory does not tell her what to do when the *balungan* (basic melody) goes lower than is comfortable to sing—that sometimes, there should be silences even at the strong cadence points of the kenongan. With large pieces like Morosonjo, if the singer sings *abon-abon* (literally shredded beef jerky; meaning additional melodic phrases) or *isèn- isèn* (a filling in) at all the theoretically prescribed places, there is a certain stiffness and boredom of structural repetitiousness.

Also, there are special melodies (*pamijèn*) for certain pieces which show no clue what she should sing. These melodies are learned by playing with others and by being taught (in situ) by master musicians, or at least by musicians who have had more experience.

In the early 1990s, Supanggah and I were discussing the difficulty of defining underlying principles in gamelan. He said that the most onerous thing for Westerners was the lack of consistency. Indeed, everywhere one looks for regularity in applications of musical practices, one will find exceptions. A telling simple example is in Martopangrawit's book Pengetahuan Karawitan where he lays out the use of *gembyang* (a musical interval of an octave) and *kempyung* (a musical interval approximately a perfect fifth) on the gendèr. In Western music practice, one might expect that—systematically—every scale note would have gembyang and kempyung applied, but this is not how it is in Java. Why? (Who knows?)

The Principle of Inconsistency could be applied to the larger view. For instance, the gendèr, for all its potential virtuosity, is actually not consistently heard clearly all the time when the full gamelan is playing. Ironically, the gendèr, and other instruments, can be difficult to hear when sitting inside the gamelan. As a player, proximity to some instruments can block out hearing other instruments. The Principle of Inconsistency means that one should not focus only on any one instrument of the gamelan. In this way, melody is a three-dimensional object. Even though one cannot hear the gendèr all the time, it is definitely missed if it is not

played. It adds dimensionality to the big ensemble, and is clear when the acoustics of the *pendhopo* (open-air pavilion) are especially good.

The Principle of Whole Sound

I wonder if Javanese musicians hear everything. I think they must hear the gamelan as fragmentally as I do, but they must have another way of understanding hearing. Maybe, they can hear bits of the different instruments and put them all together as a whole. It does not matter which bits and parts they hear, but they can feel the whole—their own version of the whole. This seems congruent with what Supanggah told me in the early 90s: that he hears everything. In gamelan, I do not think that one can really discern every note as one might be able to follow a score of a western orchestra.

To return to traffic: One is aware of everything that one needs to not bump into anyone, or not to be in someone else's way. This awareness is also clear in crowds at the marketplace or bazaar where people can casually mingle with very little touching of each other. Each person takes special care to be aware. In the same fashion, gamelan players listen to each other, at least enough to avoid bumping into anyone.

Can one really 'hear everything'? I don't think so, but one can perhaps hear what is needed, not hearing every note of the gendèr, rebab, gambang, or bonang, but enough to know what the other players intend—to the general shape of the melody.

There are many ways in which hearing the "whole sound" operates. Here a kempul, there a kenong, or one or two beats of a stereotypical pattern structure of the drummer; this can tell me where I am in the composition structure if I lose the place while playing. If I hear the male chorus *gérong,* which typically starts phrases six beats before the sèlèh (cadence), I have plenty of time to remember or figure out where to play—to end correctly at the sèlèh.

As a player of *garapan* (improvisational) parts, I listen so that I can follow the flow of what I hear. I do not need to hear every single note (that could be a Western belief that more facts mean more accuracy means more correctness), but I

must hear enough to know-feel. I react or am reminded, or coaxed to play based on hearing a gendèr fragment, a gambang going high or low, or a drummer starting a *ngaplak, pilesan* or other recognized rhythmic stereotypical phrase.

I take whatever comes to my ear (Principle of Santai and Principle of Own Way), and then react accordingly and do not worry if the other players are hearing something else. The correct reaction, like in traffic, is to go when others go (do not go alone), don't step on someone (flow), do not make sudden moves (santai).

A good example is the grace of the slow-moving Javanese classical *bedhaya* (palaces' most sacred genre) dance. It is like the oft-compared-to music, moonlight on water. What gives this quality of flow, of otherworldliness? Dancers learn to see without looking directly. It is like there is an aura by which they can sense their position within the space. This is what I can learn when musicians are in noisy conditions.

The Principle of Whole Sound applies vertically as well as to the melody (which I consider is horizontal). Verticality is the combination of simultaneous notes such as: the dyads (kempyung and gembyang) of the gendèr; or the kempul which plays a note which is not the same as the balungan (basic melody); or the gérong (male chorus) sings a cadence (or mid-cadence) which does not match with the balungan. This verticality produces differences of thickness and thinness of the timbre of the whole gamelan—which in turn, could influence a musician's choice of what to play.

Verticality is also in how microtonal intervals (*embat*) can influence a musician's musical play. The scale intervals of gamelans are not in standard tuning (such as equal temperament, or just intonation). From one gamelan set to another, the frequencies and tunings can differ. Even the precise frequencies of the notes between instruments within a single gamelan can differ (albeit only microtonally). Added to the mix is that the singers and rebab player may choose (to give a particular feeling) to express phrases slightly higher or lower microtonally.

Pulling It All Together—Let's Jam.

In this paper, I presented how the analogy of traffic jams can illuminate understanding, suggest performing negotiation, and help my ability in "jamming" (musical improvisation). By looking at street traffic, I found how individuality, togetherness, freedom to improvise (going against traffic), and unspoken signals parallel the way in which musicians interact during music-making. I have learned to understand the big picture of the Principle of Santai, Principle of Inconsistency, and the importance of rasa (feeling) and enak (tasting good). In my research direction, there are many topics, ideas, and concepts which have congruence and are helpful referential links to the western ethnomusicological literature.

But after one learns how to play a gamelan composition—when the balungan and structural elements are understood; when time and synchronization with other players are achieved; and the cèngkok and the garapan are known—how can one find one's own way to Enak? How do we know when it tastes good? When rasa expresses the wilet (variation) of a cèngkok? When we can "ngawur" and noodle around in a nice way?

It is a question of competency. Pak Cokro said that only really good musicians can play "free". What does that mean? When he admonished me to go beyond the techniques and melodies I had learned from him and recordings, and he said I must make variations, I demurred that I might play nonsense—that I could certainly make up variations, but how would I know if they were "good", that they were enak?

Pak Cokro often mentioned that I (and other students) needed more pengalaman (experience). He meant that by playing often and in many situations with many different players, I would begin to sense and understand an acceptable aesthetic and quality of performance. I must find my Own Way, without force (Santai).

In this paper, I have contrasted my western scientific theoretic approach versus something different—more intuitive, less consistent. The subtext may have

implied that on one side was the Martopangrawit versus the Pak Cokro. This is far from correct or from my intention. Martopangrawit is one of the great masters in the same pantheon as Pak Cokro who said often that Martopangrawit could play "free" and that he played in-the-moment with intuition, expression, and creativity well beyond that of most musicians. The difference is that Martopangrawit, uniquely, could explicate and give evidence of structures and elements that we in the western mind could grasp.

I hope that this research provides a balance and an illumination to the more "scientific" approaches, so that non-Javanese players can find their own search for that "aura", rasa, or whatever, of understanding Javanese gamelan, and ultimately, of the playing of it. Just like in jazz, it is a playfulness of play which is available in gamelan.

I hope to get beyond the copycat Fleetwood Mac recording I heard years ago, and can understand whether I have reached a level of musical competence—that the complexities of things that we do not yet know how to question are learned and become interactive memory enabling playfulness; that all the "principles" are linked: competency to make expression, how Enak, Own Way, ngawur and Santai all are a fluid confluence in our interactive memory.

Sometime around the year 2000, Pak Cokro surprised me by saying that *karawitan* (Javanese gamelan music) was like an ocean. I thought he meant it was vast (which it is), but he followed up by saying that in the ocean, there is everything. Like human life, it contains the happy and the sad; it contains all that is in life. But when seen from a distance or from a bigger view, it is a smooth even surface.

It is a matter of emphasis between technical and emotive orientation. The greatest contribution of Central Java to the world of music may be the prominent use of intuition. Through intuition, Javanese players have followed their tradition and have found ways to modify, coax, and have fun with their musical structures. Developments are made somewhat slowly. Musicians feel their musical way carefully. Just as in daily life, they would carefully negotiate their way through personal relations. Or, street traffic!

In the West, traffic jams are considered bad; the Javanese do not like them either, but are rather relaxed. In spite of jockeying for space, of passing "illegally", or of being cut off by someone else, there is no or very little ego. One never sees anyone getting angry, giving someone the "finger". That is the Principle of Santai. Just remember that the lines on the road are not lanes. They are guidelines!

Fig 1. The Principle of Own Way. The fluidity of a driver easily (and not surprisingly) creates a "third" lane for turning towards the right of the intersection.

References

Becker, Judith (1980). *Traditional Music in Modern Java.* Honolulu: University Press of Hawaii.

Becker, Judith, and Alan Feinstein, eds. 1987, 1987, 1988. *Source Readings In Javanese Gamelan and Vocal Music.* Ann Arbor, University of Michigan Center for South and Southeast Asian Studies.

Jumadi (1975). *Titilaras Rebaban.* Surakarta, Indonesia, Akademi Seni Karawitan Indonesia.

Gitosaprodjo, S. B.A. (1975). *Ichitisar Teori Sindhen.* Malang, Indonesia, Loka Mandayeng Guna

Gitosaprodjo, S. B.A. (n.d.). *Pelengkan Teori Sindenan.* Malang, Indonesia

Hood, M. (1960). *The Challenge of Bi-Musicality.* Ethnomusicology Vol. 4, No.2, pp 55-59, University of Illinois Press.

Horne, E. (1974). *Javanese-English Dictionary.* New Haven and London, Yale University Press.

Martopangrawit, R.L. (1972). *Titilaras Kendangan.* Surakarta, Bagian Research Konservatori Karawitan Indonesia, Departmen P. dan K. di Surakarta

------. (1967-72). *Pengetahuan Karawitan.*[2 vols] Surakarta, Dewan Mahasiswa Akademi Seni Karawitan Indonesia

------. (1972-76). *Titilaras Cengkok-Cengkok Genderan dengan Wiletannya.* Surakarta, Akademi Seni Karawitan Indonesia.

McDermott, Vincent, and Sumarsam (1975). *"Central Javanese Music: The Patet of Laras Slendro and the Gender Barung."* Ethnomusicology 19:233-44.

Sindusawarno, Ki (n.d.). *Ilmu Karawitan.* Surakarta: Konservatori Karawitan Indonesia.

Sumarsam (1995). *Gamelan: Cultural Interaction and Musical Development in Central Java.* Chicago and London, University of Chicago Press.

Suparno, T. Slamet, Skar (1985/1985). *Laporan Penelitian: Sindhen Andegan Nyi Bei Mardusari.* Departmen Pendidikan dan Kebudayaan Akademi Seni Karawitan Indonesia.

Walton, S. (1996). *Heavenly Nymphs and Earthly Delights: Javanese Female Singers, Their Music and Their Lives.* (Doctor dissertation University of Michigan, 1996.