Ndoboa - Lean On Each Other

Performance practices and micro timing analysis of Ghanian Fante Asafo Ensemble Groove Processes

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Abstract

In this following study the researcher is occupied with the study of musical performance composition practice and micro timing in traditional Ghanian (West African) percussion ensemble groove processes (using the Asafo “War dance” performance as a case study). The researcher had consecutive percussion lessons for a period of a year, aimed at learning the intimate relations between Asafo groove composition, speech drum practice and highly metrically ambiguous groove micro timing (by John Miller Chernoff (1979) also referred to as “dynamic tension”). For investigating specifically the micro timing between groove instruments, a whole Asafo performance was recorded and all groove instruments had their rhythmic patterns mapped and analysed using a novel computational tool (The Beatspanner). The Beatspanner tool was designed from the new theoretical concept of beat span presented by Chris Stover (Stover 2009), which theorises that rhythms in timeline music (music which is governed by a regular repeating bell or clave pattern) move within a metric force field outstretched between two superimposed 6- and 8-metric pulse cycles. Results from this mapping and timing analysis showed the groove musicians consistently phrased their repeating rhythmic patterns along both the 6- and 8-pulse cycle simultaneously within the same steady groove. Furthermore it was shown that musicians keep their pattern onset timings most stable in relations to each other’s pattern and not so much in relation to the virtual beat span metric grid. Finally an additional finding is mentioned, as it looks like instrumentalists collectively and systematically alternate between accelerating and decelerating their patterns together from one iteration of their groove pattern to the next. This makes the researcher suggest that this is (an unconscious) strategy for negotiating collective tempo, rather than having all musicians mentally aiming at synchronising with one metronomically stable timing ideal.

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Online Appendix:

For access to sound examples, performance video recording, extended music and interview transcriptions, plots and figures these are all available in the online appendix through the URL:

www.beatspan.space

Introduction

"In theories of African rhythm, ...basic questions remain as to where the beat is, what constitutes a pattern, whether meter exists, how many meters are in operation..., how to notate rhythm, and so on. There is, in short, surprisingly little agreement about the basic organizing principles." (Agawu 2003, 71)

In this following study I will be occupied with the research into musical performance composition, practice and micro timing in traditional Ghanian (West African) percussion ensemble groove. Central to these practices are a general participatory aspect of musical performance and a deep rootedness of performance practice into the theme of the social occasion in which it is a part. Participants of these occasions ranges from instrumental performers, dancers, religious actors (priests) as well as the audience members who all contribute to the performance's unfolding in diverse and creative ways. Central to the setting is always a percussion group playing several bells and traditional drums, building a dense and beautiful groove which intern becomes embellished and varied through the involvement of a knowledgeable and musically skillful master drummer. The master drummer doesn't just direct and build the ensemble groove together with the ensemble instrumentalists, but also turn to perform long and elaborate embellishing rhythmic speech drum improvisations into the music, weaving it together with singing, dancing and other performance elements going into composing out the specific occasion unfolding.

By local scholars these occasions and their performances are described as important happenings for expressing a communal ethos and often also takes on a religious aspect, as centuries of ancestral gods are remembered and worshiped as the instrumentalists, master drummer, dancers and priest sometimes transcend into trance-like states, while performing highly explosive and acrobatic movements emphasising the powerful spiritual energies inhabiting this field of participatory performance occasion.

Many authors of African musicology, music theory as well as performance and cognitive studies, have for centuries speculated what exactly makes up and governs these vast and complex musical textures of West African traditional percussion ensemble compositions and how all of these widely differing rhythmic structures are kept together and grooving, Further more a line of academic musicological researchers have taken special interest in these traditional musics for their prevalent sensation of poly-rhythmic density and especially ambiguous metric terrain. Some scholars describe these groove textures as presenting them with a musical sensation of "dynamic tension" (Chernoff 1979) arising from some timing relational interplay between sounded rhythms and non-sounding metric forces. By practicing musicians these musics have been explained as being played within and between two metric substrates at ones and this approach to flexible groove production has by percussionist Micheal Spiro (2006) been term to play in *fix* - not playing in **f**our, not playing in s**ix**, but playing in *fix*.

Many authors have taken on analytical approaches and terminology from common Western theoretical literature, notation syntax and Western groove studies, which all talk from a point of view of meter as a grounding psychological substrate for all other sounding rhythmic utterances to become temporally mensurable up against. While much of this research has described some extremely interesting aspects of West African and Afro-Diasporic music, several of these theoretical concepts of composition, timekeeping, rhythmic relation and performance consideration seem to clash significantly with the conceptions, experiences and compositional ideas going into learning and performing these powerful, collectively engaged performances at social occasions

Meanwhile several West African traditional musicians and participants, when asked, refer to timekeeping as something produced by a dynamic interaction between actors, constantly accommodating each others flexible playful expressivities and pattern variations, and something which varies depending on the type of music, the occasion, the instrumentalists and the audience present. While several musicologists are tempted to suggest that subdivisional categories and metric pulse divisions are central for teaching timing in beat driven music, such concepts are rarely mentioned and often discarded by interlocutors when trying to teach proper instrumental timings. Instead traditional instrumentalists are often more occupied with phrasing their patterns relative to other specific instruments going into the ensemble compositional groove, and groove building is something which happens between performing instrumentalist and right timing is something which is constantly negotiated between participants on a moment to moment basis. It is not as much deemed important whether a particular performer's pattern sounds right or wrong relative to how its onsets are placed within a specific metric category, but whether the ensemble sounds *clearly together*. This thesis will specifically be occupied with an in-depth analysis of both compositional and micro timing relations of the Asafo (war dance) performance practice, as it is performed by a group of Fante musicians from a specific local Cape Coast area in Ghana. This is a performance involving 11 musicians and dancers, which was recorded for the purpose of becoming case material for studying ensemble groove composition and timing in this thesis.

The study is partitioned into two parts. The first part is mostly occupied with the central music compositional concepts and practices making up the Asafo performance (Chapter 1-3) and the second goes on to perform a computational micro temporal analysis of instrumental timing between ensemble groove instrumentalists (chapter 4-5). Central to this study is firstly the question of how the Asafo performance is compositionally organised and performed, and specifically how the 7 instrumentalists keep time with each other in this dense and constantly varied groove texture. For this a novel computational tool has been developed to be able to visualise specific groove timing tendencies across long periods of a performance. These tools were informed by a new pervasive concept of flexible metric spaces expressed by researcher Chris Stover in his earlier work and forthcoming book "Timeline Spaces: A Theory of Temporal Processes in African and Afro-diasporic Music" (Stover 2009, forthcomming). According to Stover's theory, timeline music (which is music like that of Asafo, which is fundamentally build around a short memorable rhythmic figure played by a bell or in cuban settings the wooden claves) metric beats are

to be conceptualised as durational metric time spaces stretching between two superimposed virtual metric pulse cycle grids of e.g. 6 and 8 pulses or 12 and 16 pulses. These durational spaces are termed *beat spans* and are exerting metric gravitational pull on all onsets realised within them, making all onsets temporally engendered by both outer metric parameters at once, while not being an expressive variation of either. The metric concept of beat span are only one part of a larger phenomenologically explicated theory of how musicians are able to produce (and entrain to) even the most micro temporally complex musical contexts, among them being the Asafo performance of Cape Coast, Ghana.

While the first section of this thesis will be occupied with a large form music analysis and interrogation of music compositional concepts, the second will be an extension of these earlier argued theoretical concepts into the realm of micro temporal analysis. As I arrive within the micro temporal realm my research seeking answers to two central questions about micro rhythmic timing and flexibility:

- *Do Asafo groove instrumentalists pull rhythmic patterns into different metric realms simultaneously, as is described in literature about African and Afro-Diasporic traditional timeline musics.*
- *Do Asafo groove instrumentalists time their onsets more consistently relative to their inter-instrumental pairs, or relative to the beat span grid?*

To answer these questions, I wish to look at several timing relations between:

- Asafo Ensemble Groove pattern's average onset timings and standard timing variability (SD) relative to a beat span grid with the Agye bell timeline as its timeline-cycle pattern (later referred to as RelTP-Pattern)?
- Asafo Ensemble Groove Pattern's inter-instrumental onset timing (Avg. IOI) and standard variation (SD).

From inspecting the results of the standard variation (SD) of the Onset/pusle cycle timing analysis, a question is added:

- What can explain the increase of SD as a function of the moment of onset's placement within the unfolding of the timeline-cycle pattern?

The outline of the thesis' 5 chapters is organised such that it lays out the theoretical narrative which in

turn comes to inform the methodological approach taken in empirical computational study of instrumental micro timing in Asafo performance. In the first chapter the social and cultural context surrounding the Asafo performance practice is described and the individual participating actors, making up the performance occasion, are presented. In the second chapter, significant music theoretical concepts of rhythm, meter, accent and stress are interrogated and restated so to be able to accommodate central compositional and conceptual aspects of Asafo groove production. The third chapter goes on to describe how patterns, groove and improvisation is thought, heard and understood by insider musicians of the Asafo performance practice. This intern goes together in explaining what metric and rhythmic timing keeping dynamics might be said to apply to the unfolding process of ensemble groove. In the fourth chapter the novel computational Beatspanner tool is explicated and the recording procedure for capturing the Asafo performance is outlined. Lastly follows the results of the computational mapping and statistical analysis of timing relations. This is both relation between rhythmic onset and the beat span pulse cycle grid and inter-instrumental onsets timing between musicians.

Chapter 1: Culture, Context and Performance Practice

Asafo Company and Community

Predominantly throughout this thesis I will refer to Asafo as a term or name for the performance style which was recorded and used as empirical data for the mapping of micro rhythmic timing. This performance is actualised by what is also called the Asafo group, referring to a group of instrumentalists, singers and dancers (not mutually exclusive categories). For this project, a group of eleven performers (seven instrumentalists, one singer and three dancers) gathered to perform an Asafo "War Dance" performance as a show for me and a little audience of close family members. The performance was recorded and used as data for the study of ensemble groove micro temporal analysis in this thesis.

Meanwhile, to the Fante people (who identify as a subgroup of the larger Akan tribe, inhabiting the greater central and Western Ghana, the Asafo group is only one part of what is considered a much larger organisation in Akan society. According to local Ghanian scholars; Ato Turkson (1982) and Emmanuel Obed Acquah Robertson (2018) both affiliated with the local University of Winniba, as well as Courtney Micots (2012 - not ghanian - University of Florida), as a term Asafo first and foremost historically relates to a collective town's (para-)military force/group or warrior association of men, voluntarily serving the security needs of their community. It is historically known for performing 'enstoolment' and 'destoolment' of new chiefs (militarily installing or removing local or regional leaders), performing search and rescue assignments as well as engaging in acquisition and defending of land and resources from rivalling groups through inter-ethnic warfare.

Meanwhile, given inter-ethnic warfare has gradually halted due to economic stabilisation of the region and reinforcement of the jurisdictional powers afforded the national state over the collective tribal groups residing within Ghana territory, (Micots 2012, Acquah 2018) Asafo companies have instead served a broad range of other purposes within Ghanian local societies. Amongst such purposes are local emergency relief such as rescues during fires, fighting wild intruding animals and preventing drownings.

In general, Fante Asafo companies - like the one my interlocutors belong to - as well as their performances, myths and religious practices, are recognised as part of the overall Akan society. Akan groups share not only a great deal of cultural and historical background, but also share the same Akan language with a great diversity of dialects and off shoot varieties spread out across groups, located territorially from the coastal area, west of the Ghanian capital Accra, and way into the middle section of the country. One of the most spoken dialects of the Akan language are of the Fante and Twi variety, which are identified as the common languages/dialects for communicating across Akan and other Ghanian sub-groups. This current study is occupied with one specific Asafo company and performance practice of the

Fante people of Cape Coast, which is considered the capitol of the Fante tribe and located approximately 150 kilometers from the national capitol Accra.

While *Asafo* is used when referring to a communal group's military force, *Etsikuw* (meaning the body of men) is used when referring to the individual companies resident within the same town or part of town (Sam 2014). Such communal groups are of varying size and their populations share some similar economic and social aspects. Meanwhile, it is often so that larger cities might contain several communities within their urban territories.

The typical Asafo company is hierarchically organised and headed by the *Tufohene* or military advisor to the chief of the township. Next in line is the *Asafobaatan* (mother of the Asafo group) and then its *Supi*, meaning commanding officer. The divisional captain within a company is called the *Safohene* (if male) and *Asafiakyere* (if female). Other ranks include the companies' priest, *Asafokomfo*, head of drummers (lead master drummer), *okyerema (or Asasfokyen)*, drummers, *akyeremafo*, flag bearer, *frankaakitani*, as well as many other lower level officials like police officers, *abrafoo* and spokesperson, *okyeame (Sam 2014)*. Outside of the Asafo company, one finds the regional chief - *Asafoahenefo* - who has relations with people of the individual Asafo companies, but who are not being seen as related to such, given their special status as royalty.

Every company usually takes their name after something of local significance, like their function in war, location in the state, occupation or history of the members (Ross and Cole 1977, 186), like my interlocutor, Samuel Takyi's, company; Anafo No. 2 (meaning "the south" according to Takyi and also "down the hill" according to Sam 2014), located in the southern part of Cape Coast to this present day.

As towns have grown and territories have fused, many cities like Cape Coast have come to contain multiple Asafo companies. In the case of Cape Coast, there are currently seven companies; Bentsir No.1, Anaafo No.2, Intsin No.3, Nkum No.4., Arshell, Siwdo, and Abora (Turkson 1982, Acquah 2018).

Herein Anaafo No. 2 is considered a breakaway group of the earlier Bentsir No.1 ('Ban' meaning 'wall' or 'hill' and itsir' meaning 'head' or 'top'). The history behind this break - according to my interlocutor Samuel Takyi (which i will introduce soon) - is that young workers during the period of colonial occupation moved from the Northern hill side of Cape Coast, down hill (or to "the south", Anafo) closer to the harbour, to be the first to reach the harbour when workers were needed by the imperialist forces (Takyi, personal comm. - see also; Sam 2014, 23). This move led to the establishment of the new Anafo No. 2 Asafo company, and with it came a new and innovative style of Asafo performance. Among the performance innovations was the addition of an extra Asafo bell to the two already played in the Bensir No.1's Asafo style, hereby creating distance to their parents' group and establishing themselves as a whole new generation, building and running an area as their own new and separate Asafo company.

Asafo Group, Performance and Origin

Each Asafo company has, beside their military leaders and associated social group members, a group of performers comprised of one or more master drummers (safohen), instrumentalists, singers and dancers that perform for several types of occasions, always involving the performance of the flag dance. The flag is believed to inhabit the Asafo spirit and is always carried and protected by the *frankaakitani* (flag bearer) flanked by guards known as *arekanbofo*.

Not much is known about the origin of the Asafo performance practice, but it is being posed that some central performance elements and acts, such as the use of flag in dance performance, can be traced back by multiple sources to the seventeenth century. Here, flags were carried by the people of the Fante town Fetu to plead allegiance to their king and overlords in festivals settings (Jones 1983, 168) and flag dances were performed for the Dutch agent John Barbot in Cape Coast around 1679 (Barbot 1732, 565 referenced in, Labi 2002, 29, Micots 2012, 26).

In contemporary Cape Coast, Asafo performance practice is in its essence a religious ceremony, carried out as religious theatre invoking spiritual worship of traditional ancestral gods. Asafo has by some religious groups, such as Muslims and Christians, been termed fetish religious activity, which according to my informants have made participation a highly controversial act in the past. This has impacted how the practice has been passed on for the last few centuries. This includes the ability for the broader public to understand speech drum utterances, a highly central part of the Asafo performance as well as compositional process (which I will return to later). Much of this has been lost, and only few elderly expert performers can now be termed “fluent” in speech-drum practice.

The whole performance, which could be summed up as theatrical staging of religious rites and rituals, composed of (1) instrumental playing, (2) singing, (3) dancing, and (4) speech drum expositions, is led by the traditional village priest and one knowledgeable lead master drummer. Central to the Asafo practice, amongst other things, is the strong spiritual energy attributed to certain instruments, performers and aesthetic (musical, dance and visual) concepts of the performance. These serve as important forces informing the composition and unfolding of the music and dance performance practice of any occasion. Spirituality, in this context, is centred around the appraisal and worship of ancestors which in Fante traditional religion are people who are “dead and gone”, but who are believed to have led successful lives and had great importance to the community life. In other words, lived life worthy of emulating (Acquah 2014).

Originally, Asafo performance was associated with the performing of religious rites and rituals as part of significant events related to inter-ethnic warfare. This includes rites where priests would ask ancestral gods for help and strength before setting out into war, or thanking and praising ancestral gods for one’s successful return from the battlefield. Furthermore, these types of performance settings would also involve dance, song and chant and ridiculing rival groups as a ritualistic theatre, conveying local myths of historical and moral nature, evoking important sentiments and maxims to one’s particular tribe.

While main themes and performance practices remain, occasions to do with local warfare have ceased and changed the function of the Asafo groups to mainly perform at; local celebrations of important people in society (e.g. at visits of chief or national leaders), funerals and festivals - none being mutually exclusive (Labi 2002, Acquah 2018).

According to Sam (2014), there are three themes that can be said to undergird Asafo performances at any given occasion in contemporary Cape Coast; "(1) theme of appreciation, appeal or supplication to their deity, ancestors and great leaders, (2) military theme, centring in on war, struggle and demonstration of manliness and brave artistry and (3) lastly the theme of ridicule, satire and abuse which works to develop intense local rivalry among companies." (Chapter 2.2, Sam 2014, 22).

For gathering insight and gaining familiarity with the Anaafo No. 2 company's specific practice of the Asafo performance, I had originally received funds and made arrangements to travel to Ghana for a two month fieldwork period from July 1st to August 31, of 2020. Meanwhile, due to the global situation surrounding the COVID-19 pandemic, these efforts were wasted and the fieldwork proposal was refitted to accommodate the new circumstances. Instead, I as a musician and researcher, took advantage of my extended network of Ghanian musicians residing in Denmark, which additionally made a longer period of instrumental lessons and number of personal conversations possible.

Fieldwork and Informants

During a period of a year, I have attended lessons, had in-depth conversations and interviews with my main interlocutor Samuel Takyi (pronounced Te*chi*), a Fante master drummer and good friend from before embarking on this current project. Besides being my teacher, Takyi has been my contact (gatekeeper) and fellow organiser when gathering the Asafo performers for the performance recording. During the research period I have engaged in many conversations with Takyi on the subject of Asafo performance practice, where I have most commonly embedded his insights on a notepad, smartphone or audio recording. From August 1st of 2020 to August 31st of 2021, Takyi and I have met for weekly percussion and music lessons, to strengthen my familiarity with the instrumental patterns and their interrelationships, as well as for me to get the sensation of playing the patterns together with him and experiencing the timing needed for patterns to interlock or "sound clear" together as suggested, as a more astute term, by Acquah (2014, 59). Furthermore, I received insights and practiced introductory speech drum sentences, to be able to phenomenologically grasp the interrelation between sentence structures of speech into structures of drum speech. While there are definite rhythmic patterns and dance parts which individually may be seen as indispensable to an Asafo performance, the overall composition of large form performance progression and interrelation in ensemble playing varies significantly, depending on what the overall theme of the present occasion entails.

Thus, in what follows I intend to only occupy myself with the analysis of the particular performance presented here in the form of the recording done with Takyi, dancers and instrumentalists. This particular performance is meant to imitate the performance outline and ceremonial exertions of a celebratory festival occasion, akin to that performed by the Anafo No. 2 Asafo group at the Oguaa Fetu Afahye festival running from the last Tuesday of July and culminating around the first week of September in Cape Coast. This particular performance is part of an occasion during the festival, wherein the Asafo company celebrates the 'circulation of time' in Fante society (though not in the European sense of the beginning of a fiscal calendar year). The tradition is strongly related to the annual celebration following the end of the harvest season. This has later expanded to become a festival occasion wherein several Asafo companies, popular orchestras, and other entertainers come to mark this seminal time of year and its momentary period of abundant food and funds (Okyere 2013).

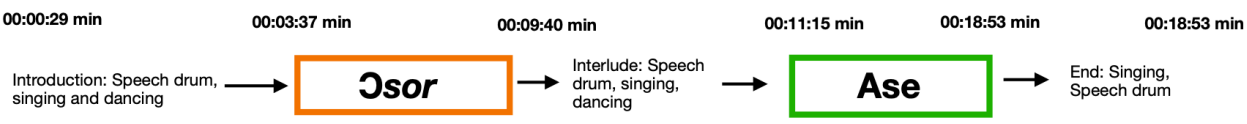
The particular performance represented by the recording of this particular thesis, is one which mainly serves as entertainment and, thus, doesn't usually involve an acting priest as part of its unfolding. This, meanwhile, doesn't mean that the occasion is not entangled with traditional religious forces, connected to the worship of ancestral gods. Such forces, while not being called upon directly by a traditional priest, is latently contained within and embodied by, the drums and sometimes their handlers (the master drummers). Furthermore, while not being addressed in detail by this thesis, some dancers are also seen as able to embody these strong religious forces.

General Form of the Asafo Performance

As for a general form of the Asafo performance, it can be divided into two distinct parts; the ensemble parts involving all instrumentalist playing together **(see Fig. 1)**:

- ɔ*sor* (pronounced phon.: Isɔr)
- *Asé (*pronounced phon.: Asɛ - which across Fante people works interchangeably with the term *Famu*)

Each part is preceded by a speech drum and dancing performance part, involving the master drummer and one or more dancers, played in free time and only with singing as ensemble participation (video of performance recording available at full length in the online appendix)



[Fig. 1: Large form of Asafo Performance]

The first part of the performance, ɔ*sor* in Fante language means “up”, “high” or “top”. In a musical sense, this translates to *hyew*, lit. meaning “hot” or “fast” and *mbanyin* literally translating into “the male way”, meaning that this part of the performance is noted for its “vigour” and “qualities of aliveness, high intensity, and speed [which] characterizes an African ideal of artful muscularity and depth of feeling” (Thompson 1974, Acquah 2014).

This part is only allowed to be danced by men, as it is not uncommon for dancer, priest and master drummer to enter a state of trance, sometimes involving very explosive and violent outbursts of sound, movement and language, while sometimes themes of war, struggle and hardship are theatrically acted out through dance and speech drum utterances, always under the control of the master drummer. Both the nature of these themes, and its accompanying explosive and violent exertions, are believed to be incompatible with women’s bodies and spiritual essence, thus excluding any women from playing or dancing during this part of the performance (Acquah 2018, 22).
As all performances which express sentiments of war, the Esor part includes a flag dancer that handles and juggles one or more of the company’s significant flags, sometimes belonging to significant members of the community - like military leaders (*Tufohene*) or the chiefs (*Asafoahenefo)* of the Akan area - or a flag that relates to specific stories of success on the battlefields, sometimes even designed to illustrate humiliating historical events of other rival companies in the region.

Asé means “down”, and also refers to the term bɛtɛɛ , literally meaning “soft” or “cool”, as well as *mbaa mu* (lit. meaning “in a female way”). It is characterised by a slower tempo and a more relaxed performance style compared to the Esor type, which is - according to the experience of insiders - much more high speed and experienced as involving much stronger spiritual energies, also craving more athleticism to execute as a dancer. The Asé, thus, becomes the part where women might join in on the dancing as it is slower and believed not to be as strong in its spiritual energies. This part might in some instances touch upon the theme of victorious homecoming and celebration after war, and the women hailing the warriors for their prowess and strength. Furthermore, the Asé part allows for more variation by the ensemble instrumentalists, as well as for the master instrumentalists. Here, performers also urge members of the audience to clap vigorously, to incite dancers to enter the performance space and engage in the creative celebratory process.

This again varies a bit depending on occasion and specific Asafo company, but in the context of the Asafo performance recorded for this study, as well as the practices of both the Effutu and Mando people described in literature, this can be considered a pretty accurate generalisation.

Asafo Group and Instruments

Asafo groups come in different constellations, though always led by the leader of the drummers Asafo kyen (lead master drummer) who plays the talking drum, Opusu, also known as the elder drum, kyen panyin **(see Pic 1)**. Sam adds that this "[…] is the chief drum among the set and it is upon its call that the other drums can start to play" (2014, 66). In translation, Opusus means the one which shakes, etymologically connected to the verb purim; meaning to shake (according to Takyi's Ghanian Fante-English Dictionary - Mu Kasa 1971).

[*Pic 1: Agyeyedo, Opusu, Ampah and Ansarba drums*]

Before moving onwards with the drums, an introduction to the bells are appropriate, since two out of the three bells are believed to provide the foundation which all other patterns are added to.

Bells

In the Anafo No. 2 group, there are a total of three bells, *adawur*, each with their own name and important part in the ensemble groove. The bells are: the main bell (or timeline bell), *Agye*; the supporting bell, *Adem;* and the master bell, *Amponsa* **(see Pic. 2)**.

Firstly, there is the Agye bell, which is recognised as the governing timeline pattern, meaning that it is providing a repeating pattern (rarely varied), working as a shared temporal framework and rhythmic topology for subsequent patterns (and instrumentalists) to build on top of - or out from - when establishing an ensemble groove.

While we will return to role and the affective relations going into engendering the Agye as a governing timeline pattern, I will briefly invoke the alternate term Topoi, suggested by Kofi Agawu to describe the identity held by timelines in many African musical contexts, stating Topoi as : "[…] commonplaces rich in associative meaning for cultural insiders" and "a short, distinct, and often memorable rhythmic figure of modest duration (about a metric length or a single cycle), usually played by the bell or high-pitched instrument in the ensemble, and serves as a point of temporal reference. It is held as an ostinato throughout the dance-composition." (2003, 73). While one of the most central patterns in the ensemble groove, it is mostly the youngest or most inexperienced player that plays this bell as it is seen as an all important rhythm to be familiarised with, before becoming trusted with other instruments expected to provide a wider array of nuanced rhythmic phrasings. The Agye bell is always accompanied by the Adem bell which translates to "intermingled" bell, referring to its close association and relation with the Agye timeline pattern. This relationship is kept through every performance and only very rarely succumbs to variation.

[*Pic. 2: Amponsa (Master Bell), Adem (Intermingled Bell) and Agye Bell (Timeline Bell),]*

As a special case among Cape Coast's Asafo company groups, the Asafo No. 2 has added a third bell, the Aponsa, being played mostly by senior master drummers well versed in the talking drum language and occasion performance practice - thus being called the Master bell. For example, such a master drummer might be a former *Asafo kyen* (lead drummer) who has reached a particular stage of physical ageing. This challenges his dexterity and speed on the master drum, leaving him to pick up the master bell that, while being physically significantly less demanding, still asks for high degrees of talking drum knowledge, as the bell is sometimes expected to respond to significant calls expressed by the ensemble's master drummer.

Supporting drums

Returning to the drums - see picture above - , a "first supporting master drummer" always sits next to the lead master drummer, playing the *Agyeyedo* (of similar etymologies as the Agye bell) which literally translates to "to respond to", referencing its function as a drum, specifically used to respond to the master drummer's calls.

Flanking the right side of the row of four Asafo drummers is the first supporting drum, *Ampɛh*, played by a player - in Anafo No. 2 company - that has the skill set to take over the master drummer's regular drum part, in cases where the master drummer either stops playing, or engages in highly complex improvisational soloist-like playing. Finally on the left is the second supporting drum, *Ansarba*, which, together with two of the three bells (Agye and Adem) always provide the steady basic patterns that make up the foundation of the ensemble groove. This drum is seen as forming a firm compositional relationship with the Ampah, and is the smallest drum providing a very high-pitched stick stroke sound, earning its name which is etymologically related to the local Ghanian hummingbird, *Ansɛr* , swarming the Ampah.

Furthermore, the performance is often accompanied by hand claps from the audience as well as dancers. Dancers additionally carry bells or dried seed packs on their feet, sounding the rhythms of their foot movements. Together they play out the two different Asafo performance parts (*ɔsor* and *Asé),* which,, very simply put consists of a continued ensemble groove that is repeated (also accompanied by participating clapping audiences), and varying speech drum improvisational exchanges between one or multiple master drummers.

I wish to invoke three different groups of acting identities constituting the Asafo performance practice as a social occasion. These are groups made up of situated" actors", each contributing to the democratic negotiation of the processual unfolding of a specific occasion. Each group's situatedness comes with a certain mode of participation (or musical contribution) and mode of experience, accommodating the individual's music skill level and knowledge of compositional complexity.

Participating groups in the performance occasion

The first category is the identity attributed to the master drummers, whose knowledge exceed that of the simple ensemble composition and extends to deep-levels of knowledge to do with ceremony, religious practice, tribal history, societal ethics, morality and how to invigorate a crowd.

Master drummers

Most importantly, the master drummers are unique to other instrumentalists as they are well versed in speech drum language and drum signalling, not just in a performance context, but also in other contexts. This knowledge allows them to handle and use the instruments as mouthpieces for engaging in ceremonial dialogue with each other (there being between 2-4 master drummers present in one ensemble group), or eventually with a priest, if one is part of the occasion. While these skills are highly musical, when becoming part of the Asafo performances, most master drummers are taught through their upbringing outside of a musical ensemble context, and invited to fill the part of master drummer when needed in ceremonial occasions, after having gained enough speech drum knowledge and versatility. Their skills are taught through recitation of verbal sentences of varying types, which are then transferred into pitch relations of different drum sounds. These sentences all have to do with spiritual, religious, cultural, social and everyday moral and ethical subjects, which makes the master drummer spiritually knowledgeable and able to express this through the speech drum as a mouthpiece. According to Takyi, speech drum sentences are normally structured as *proverbs* (meaning; in this context *sayings* of religious or socio-philosophical ethical nature) and *appellations* (meaning *titulation* to do with high ranking Asafo members, local royal chiefs as well as many other honorable people in society, including the master drummer himself).

Ensemble musicians

Secondly, there are the identities attributed to the instruments and their distinct interrelations. These relationships are intimately coupled with the instruments' supposed gendered spirit, and overrides the notion of the handler's identity, as this person is expected to only play a prototypical rhythm pattern, and a limited selection of variations specific to the drum's identity and functional role on the ensemble groove compositional level of performance (which is not the same compositional discursive strata in which master drummers operate, when playing their drums as mouthpieces, uttering speech drum rhythm).

Patterns on the level of ensemble groove fit together in a very predetermined fashion, and all instruments (also those played by master drummers) have one (or sometimes several) significant prototypical patterns which are played repeatedly, adding to the ever-present and ongoing ensemble groove texture. In Asafo, <u>at least</u> three instrumentalists play their instruments in this repetitive fashion, during the whole performance - Agye, Adem and Ansarba. These are skilled instrumentalists, who are <u>not</u> well versed in talking drum

language practice, but who know the prototypical patterns as at least one of two types of mnemonic constructs. To most instrumentalists, rhythms are actually heard and as their melodic constructs which comes from rhythms fundamentally being coupled with speech tonality through the practice of talking drum in musical context. Speech drum language effectively imitates tonal features of language that is phonetically distinctive to Fante speech - a topic which we will return to. In other words, instrumentalists can be said to learn and understand their rhythmic patterns as melodic or sentence-like mnemonic constructs (outlined in greater detail further down). Not only do the musicians know the rhythms, but most importantly they also know how these go together. These musicians have been trained by joining a instrumental group, which comes together to learn and practice Asafo performance - among other traditional musics - so they know how patterns relate compositionally to each other and they know the basics of how master drummers communicate during a performance process.

Audiences

Lastly, there is the identity of the audience, which is seen as an active participating group in the musical production of any performance at an occasion like the festival. Audience, as well as awaiting dancers (when not doing dance expositions), all engage as co-producers of the performance groove through clapping and stomping different prototypical rhythmic patterns. The nature of these patterns (one of them being that of beat pulses, which I will return to below) hold special status in explaining why this music is metric in a meter-like way.

Audience members have a different level of insight into the practice's compositional aesthetics, but most participants don't know of the speech drum compositional aesthetics, or what is being said specifically in the speech drum call/response dialogue between master drummers. What is recognised by the majority (also ensemble musicians), is the specific master drum signal telling the participants to stop or proceed, increase tempo or be ready for dancers to enter. Meanwhile, participants add their element of motion to the performance, by moving or clapping as a way of actively experiencing the performance through co-producing it from their specific situatedness in the music as a process.

From this, a three part model can be constructed where different groups' identities keep their relative position in the process of co-producing the musical process central to the occasion.

Trans-subjective Processual Construct of Occasion: Modes of Participation as Modes of Experience

I will illustrate in the coming section, that Asafo performance is constituted by a trans-subjective field of modes of participation. Each mode of participation is recognised as a specific subjective mode of experience, discernible into three acting groups of identities, each experiencing the totality from their specific mode (or level) of participation and understanding. Some participants, like the master drummer, might experience the whole performance in a widely different (complex) way, than e.g. that of the audience or ensemble musician - due to his knowledge and proficiency as a trained musician and performance orchestrator. Meanwhile, I have yet to encounter my interlocutors talking about a universal *right* or *wrong* "mode" of experience or "level" of experience.

Interestingly, Sam (2014) presents statistics from a population of 228 respondents from the larger Cape Coast area, who were interviewed about their level of insiderness into the Asafo performance practices and specifically speech drum expressions. His research show that 33% doesn't understand the speech drum language played on most occasions, 67% can interpret the drum language on some occasions, whilst *Supi's* (commanding officers) and Asafoahenefo (chiefs) represent 100% of the population understanding drum language on some or most occasions (2014, 51). Close to 90% of all questioned claim to have some fore-knowledge of Asafo drum language.

It is acknowledged during my lessons with Takyi, that each participant has a particular mode of experience depending on their knowledge and proficiency of different aspects of performance, like; speech drum, dance, instrumental patterns (and their variations) as well as historic, religious or cultural knowledge. According to Takyi, all of the parts and positions in performance are necessary and important in their individual way for an occasion to happen, meaning that occasion is not just dependent on right performance, performance is also highly dependent on the right occasion, with all the right groups of participants, for it to unfold in a right way. In other words, the line that is sometimes drawn between performer and audience, the producers and the consumers of music, is in this context non-existent in a very real sense, as all individuals present at one occasion are always being deemed present qua their active participation in the performance process itself. Without participation, no occasion, and no (proper) performance without all the different groups of participants contributing their part to the whole texture, as well as the individual's mode of participation being a big part of the individual's mode of experience, leaving both things to merge and become one.

This trans-subjective unfolding process of Asafo performance, according to Acquah (referring to culture theory by Frith and Stokes), works to structure and strengthen a socially shared identity of different individual Asafo groups as well as the Fante people in general:

“Music is seen as constituting, rather than simply reflecting[,] identity since both music and identity become more flexible and less reified (Frith, 1996 and Stokes, 1994). When, for example, drummers are able to sound clearly together, they express their sense of belonging and identification with the indigenous population. The people possess a deep understanding of their culture[“al” omitted] and performance milieu as well as their formal, stylistic [“and” omitted] identities.” (Acquah 2014, 59- corrected by the researcher for clarity)

These diverse modes of participation and modes of experience can thus be said to be co-present, co-constituting and co-producing the occasion through their ongoing engagement in performance. Furthermore, the predictability and guiding aim provided by the strong forces of cyclicity inherent to timeline musics, can be said to aid all participants, especially audiences that have little musical training in their individual progression toward mastery of their participatory instrumental, singing or dancing parts of the whole performance context.

To this point, it is fruitful to mention Louis Manuel Garcia’s (2005) connection of foundational ethical notions to many traditional West African societies, like “corroboration, sharing and contributing” to the concept of repetition and the trans-subjective construct of traditional performances, which are a very foundational dynamic undergirding any timeline performance. Garcia looks into *repetition* as a process and cites John Miller Chernoff’s (1979) optimistic viewpoints on this subject, saying that repetition; “[…] allows for a more participatory mode of music-making and, in turn, that the interlocking layers of West African percussion use repetition to ‘lock’ its participants into a musical instantiation of social relationships” and “sees collectivity in repetitive music, but instead maps this to a more benign *communitas,* whence individuality can arise without being alienated”” (2.14).

In Fante context, a term is offered up by Takyi, for describing the this *communitas* going into producing, driving and maintaining a collective musical groove process like that of the Esor and Ase parts of Asafo. This term is *Ndoboa*, which literally translates into “leaning on one another” and is used for describing social processes that are build on a premise of ongoing interdependency between multiple actors. This is a term regularly used for describing a fundamental premise of one of the more prevailing farmer labour systems of Ghanian tribe communities, where “community members formed groups of five to ten members to help one another on their farms on rotational basis. The only cost that a host farmer incurs in this system is providing food and water for the group” (Peprah 2002, 61).

In a musical context, Takyi refers to this as a principle of co-dependance being had between musicians when producing a groove and he phrases it as a concept wherein the “leaning” is not done onto one distinct actor, but is a leaning of all actors “on each other”, co-depending on each others’ “lean” for any collective progressive motion to be undertaken. He says, that while not commonly used in everyday language around musical performance, this is a term known and used between elderly and philosophically knowledgeable Fante individuals, as a concept to astutely describe the collective impetus driving the

trans-subjective process making up the Asafo performance context. It works to describe efforts and intentions going into building and maintaining a continuous groove process, and also the considerations going into the groove production of not alienating any single participant, but instead try to negotiate the groove differently so no to alienate any committed contributor from participating in the musical process. This is expressed in my interview with Takyi, as he says:

02:13:26 - 02:14:18

“Even if somebody is dragging, you don’t say “hey, why are you dragging?”, no! We try to help by playing it, [maybe recognizing] “hey, it is too fast” and try to reduce your [tempo]. If you are the master drummer you try to reduce [tempo] or try to say [to the one dragging], “come, come, come” [waving or signalling instrumentally] pushing them to where they should be, and then finally meet in the middle point [in-between a ‘too fast’ ensemble groove tempo and the instrumentalist dragging]”

What Takyi means by this is that there is always a twofold response to anybody dragging, and this is both reducing the tempo, and encouraging a slower (dragging) instrumentalist to increase his tempo a bit, as he states earlier in our interview “If we don’t help each other… we can’t play good music”. In this thinking groove is not a predetermined envisioned product which needs producing, but an unfolding occasion and trans-subjective context where different actors leaning on each other’s musical input and seeks to keep the process “balanced” and continuously progressing and unfolding.

Before heading into how ensemble grooves are built, it is important to understand how rhythmic patterns are construed in general, which has something to do with the intimate relations being had between rhythms and speech, meeting in the practice of speech drumming.

Performance Composition and Speech Mode Drumming

While this thesis is mostly occupied with groove composition and micro timing, the focus on speech mode drumming is limited. Nevertheless, because the question of how accents are inferred, and how metric cycle is inferred by the central timeline pattern (which we return to), I believe it is fruitful to briefly define the link between speech and speech mode drumming. Additionally, Takyi underscores that; without knowledge of right speech mode drumming, Asafo performance practise loses its meaning in relation to the occasion. This is due to the literal content being uttered in speech drum sentences, and proverbs intimately (semantically) linked with the theme, rituals and rites of a particular occasion (funeral, time circle celebration/harvest celebration, hailing of gods or significant personalities etc.). Dialogical exchanges between master instrumentalists and eventually the priest would thus lose its meaning, and lack the impetus informing choices made in the unfolding of performance process.

Chernoff in context to Ghanian Ewe master drumming and traditional ensemble performances writes: “[a] rhythmic pattern is more properly considered as a phrase than as a series of notes” and continues “Their language is a fundamental dimension of their lives which they bring to their music, and people associate melodies and rhythms with speaking because their speech has meaning in terms of its melodic and rhythmic character. If you play “gegedega” instead of “gegedegi″ when executing a phrase on Atsimequ, or if you miss the pitch when beating a dondon, you may have made a more serious mistake than you think.” (1979, 80)

Speech drum has different definitions to different scholars, but as I proceed, I choose the definition I find most astute and helpful in capturing the essence of the speech mode drumming which I have experienced while being taught simple talking drum proverbs and appellations, during fieldwork instrument lessons with Takyi, defined by Sam as;

> “Sounds produced as idiomatic signals based on a particular speech pattern with fixed context-dependent message. This makes drum languages culturally defined, depending on the linguistic boundaries of that culture. Sometimes misinterpretations occur in decoding the message therefore not all, even of that same culture or linguistic background, are likely to understand the phrase or words of the message.” (spelling as in the original - 2014, 35)

As an example of “a particular speech pattern with fixed context-dependent message” one can take the introductory passage of the Asafo performance (shown on the proceeding page - and in **sound examples 1.1 and 1.2** in the online appendix), where the master drummer performs a greeting of the crowd and presents himself as well as addresses the circumstance under which they have gathered – in this context the celebration of the year’s circulation during the Oguaa Fetu Afahye Festival.

In practice, this passage was taught to me by Takyi, who initially expressed the exact pronunciation of a given proverb or appellation in Fante dialect, and then subsequently transferred several of the words' phonetic features to the drum, using one stick and one hand on the head of the drum. What is important to understand about this process is that it is the linguistic features of the proverb or sentence being said that is mimicked by the sound colours and rhythms expressible through the drum, including features of dialect, like collapsing or omission of syllables.

What makes this mimicking possible in Akan language (where Fante falls within its dialect continuum), is that these, unlike most Indo-European languages (like English, French and Portuguese), don't rely on stress patterns for proper pronunciation and phonetic distinction of words, but instead is considered a tone language (Arom 1991, 200). This, meanwhile, doesn't mean that phonetic stress patterns can't be utilised as features of dialect. What puts tone languages apart from stress languages is the way specific pitch and

pitch-changes between syllables are considered one of the most distinctive phonetic features in determining what word is being pronounced. Arom states “the syllable, when uttered at different vocal pitches or registers, may carry quite different meanings” (1991, 11).

What connects a master drummer’s speech drum patterns to the theme of the occasion is not something of associative or metaphorical nature, like rhythms drawing on previous musical associative meanings inferring sentiments that are assimilated to the performance theme. Rather, the master drummer throughout a performance bases much of his playing on these literal speech drum patterns, made up of; customary sentences, *proverbs* (of religious, historical, moral or ethical kind) and *appellations* (titulations of important participants) appropriate to a particular performance occasion.

As part of the training and upbringing of a master drummer, he has to not just know how to handle and play the instrument with great dexterity and ease, but also be aware of both his company’s history, religious rites, its societies’ grounding ethical principles, good morals, great wars, contemporary collective struggles and successes, to be able to conduct the performance in an astute fashion. This should be done purely through the right use of proverbs or talking drum sentences, inciting the right types of sentiments, even though many only have limited understanding of the talking drum language underlying the compositional process.

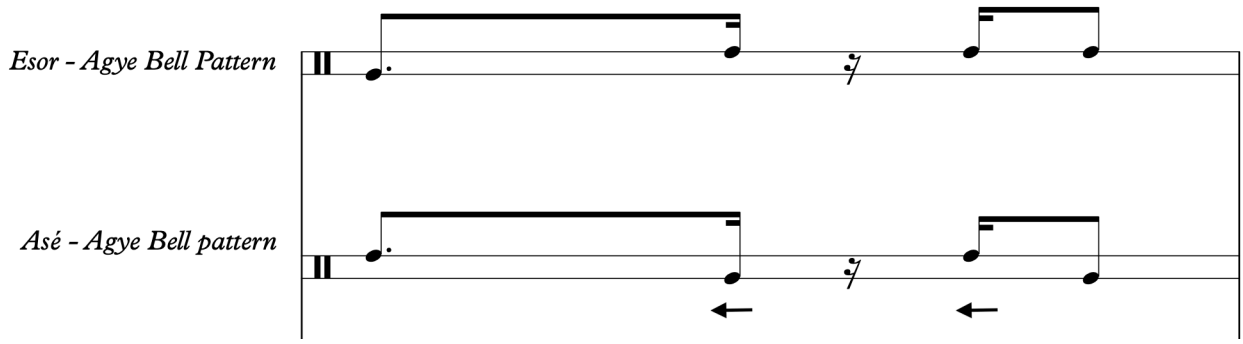
1 Odo-ma-nkoma, boa_(a)dze	1 The all mighty, who created things
2 Brobro, boo_(a)dze	2 Toiled/suffered - to create
3 M'abodzin, wofre m' den **M'abodzin, wofre m':**	3 What is my applilation called? What is my applilation:
4 (Appellation) **Kwame ato apem**	4 Takyi's appellation has meaning (boy's name set after the day he was born (Kwame = Saturday) and "came to meet the thousand - before you came, there where 1000 born, and you have met them already in the place that is before the becoming human): A. I am blocked/there is now way in front of me) B. I have met 1000 - meaning multitude/largeness/grandness (Connected meaning is: The one who has met such grandness, is a strong person, not an ordinary person, lucky person)
5 Asaase na huntuma (a)bo ngua wori dzi asem ben?	5 The land and the dust, has met together, why have they done so (what are they discussing)?
6 2 x Afehyiapa (Alt. Afeshiapa) **- Afe**	6 Happy new year or happy year circulation
7 Afe nko_mboto h(e)n	7 This occasion/time of year circulation should meet us agai-n (as in the future)
……	……

Ensemble Instrument and Groove Composition

As mentioned earlier, each individual instrument is recognised as having some identity relative to each other, that also informs us about their patterns' compositional function in the steady ensemble groove. It is recognised that each instrument has previously gotten their identity from the spiritual gendered energies attributed to them in religious contexts. Meanwhile, due to Asafo as a religious performance practice having become increasingly rare, compared to other more popular performance practices, there has been a fall out of indigenous knowledge to do with the different instruments' religiously inferred identities.

Instead, the instruments functional relationship, that once was established in accordance with their gendered religious identities, is still important, though the different instruments have now taken titles that relate them to their compositional function in ensemble performance. If one had to relate these identities to religious contexts, according to Takyi, many contemporary master drummers would have to consult older master drummers or priests for this information. Some of the gendered energies are, meanwhile, hinted by the specific gender of the animals providing the hides for the drum heads. The elder drum *Opusu* (master drum) receives hide from a male goat, as the Agye drum (supporting master drum) gets it from a female goat cementing their relationship as master drum pair, which I will return to. Secondly comes the *Ampah*, first supporting drum, made from male antelope hide and then the *Ansarba*, second supporting drum made from female antelope (Nzewi 1974, Sam 2014).

According to Arom (1991, 207), these instruments' rhythmic patterns, individually are always cyclic formulae, with no intermediate sub-pulse level between the regulating pulsation (beat pulse) and the temporal organisation of the figures as a whole. Arom quotes Nketia (1963, 10) saying; "The African learns to play rhythms in pattern", which means that the African children perceive rhythmic figures as totalities, comparable to learning to read by, what he calls a "whole-word" method. Words, instead of being based on juxtaposition of letters and syllables, precede by recognition of words as wholes, and the African child, in the context of music, learns each rhythmic formula as a whole without breaking it down into its constituents. This was made very clear to me during a music lesson, as Takyi suddenly worded his own realisation that the main bell patterns (Agye, timeline pattern - **Transcr. 1**) of the Esor and the Asé part of the Asafo, could actually be said to be similar, because they both had four onsets and the pattern they play was, looking from the point of view of Western notation, not too different from each other. Instead, he says, they could perhaps be understood as the same pattern (prototype) but with different phrasing, an interpretation I myself intuitively have sensed from the beginning of our lessons, but never worded, as I did not consider it valid in this specific context.



[Transcr. 1: Agye bell patterns of the Esor and Asé part of Asafo]

He explains that these two timeline patterns, to him, have always been distinctly different from each other, because they categorically fitted into the structural ensemble pattern texture of two different parts of Asafo (also parts that are coupled to widely different energies, sentiments, speech drum utterances etc.). The reason for his sudden realisation, according to himself, was that he is now attending an international Bachelor's education, studying to become a primary school teacher, and is as part of his music course learning music notation, music counting, subdividing of rhythmic structure and Western music analysis. As we talked about this connection, he added that such a thought would never make sense to fellow Asafo master drummers, like his uncle. Instead, patterns, according to his uncle's thinking, fit together with other patterns into the totality informed by the nature of the occasion wherein it is a part.

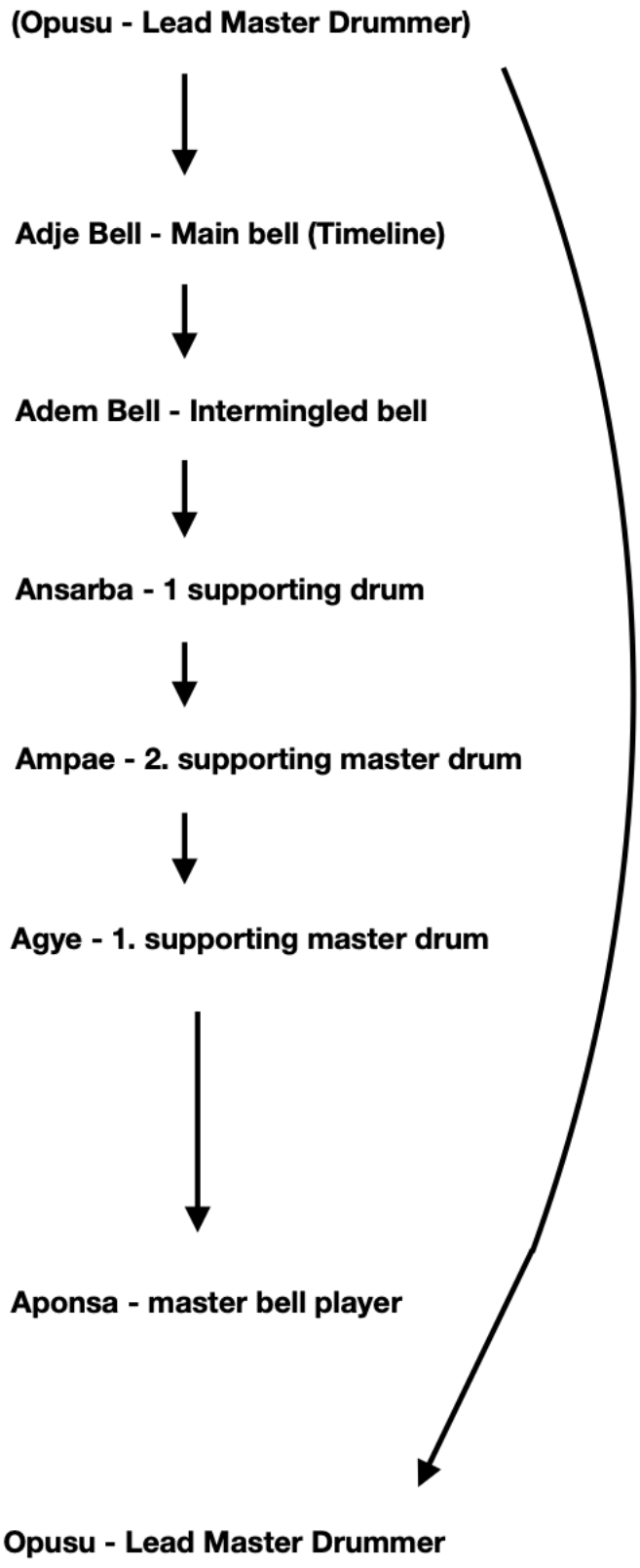
This is supported by Chernoff writing about Ewe traditional performance practices: "Ibrahim [Takai, Ewe master drummer - interlocutor], however, complained that he could not 'hear' his variations when he played without a second Dondon [not the timeline, but just a paired instrumental part]. He regarded the counter rhythm which would tend to throw Westerners off the beat as the only thing that kept him on time and enabled him to hear what he was playing and to be creative. It may have been the first time he had ever played the Takai drumming by himself." (1979, 53). Chernoff also adds elsewhere: "We can think about this difference in sensibilities as the difference between perceiving a rhythm as something to "get with" or as something to "respond to"[…] Ibrahim felt that his isolated beating was meaningless without a second rhythm, but more than that, he could not even think of the full range of stylistic variations he might play without the beating of a second drum. There is no *conversation.*" (1979, 55- italics in the original)

Furthermore, another feature springing from the mnemonic coupling between rhythms and speech, shows when I asks Takyi to play a rhythm from its beginning. This beginning is, in many cases, not the same as the cyclic beginning point which all ensemble patterns fit into when playing together in ensemble groove performance. This shared ensemble groove cycle beginning point has by Anku been termed the Referential Time Point (RTP). This unique rhythmic pattern beginning point, meanwhile, corresponds to the rhythm's beginning as a speech drum sentence or rhythmic melody, and most musicians actually prefer to enter into the ensemble groove from this pattern beginning point. These beginning points, for all

Asafo groove patterns, are notated in **Transcr. 2** in the online appendix, together with an arrow marking out the ensemble grooves RTP (in the spirit of Anku's transcription strategy). As can be seen, even the timeline Agye bell shares its pattern beginning point with the ensemble groove, which underscores the highly indivisible nature of speech drum or rhythm-melodic constructs.

Meanwhile, when patterns are absorbed into a given groove texture, it assumes a specific relational position together with at least one other instrumental pattern. Some of these relations are explicitly stated in Sam's (2014, 65-74) walkthrough of the Asafo instruments' positions in the ensemble performance context, as well as in my lessons with Takyi. Some simple relations between ensemble groove instruments (and rhythm figures) can be gaged from the successive pedagogic Asafo groove building process, done with beginner musicians **(Fig. 2)**. This groove building is not explicitly represented in the recording done for this thesis, as skilled ensembles usually launch collectively into the groove process. Meanwhile, the recording method used for recording this Asafo performance allows me to artificially build the groove by mixing the individual drum tracks consecutively onto each other, which can be heard in **Sound Example 2** in online appendix.

Everything is started by the master drummer firstly delegating the pattern of main bell (Agye), to the youngest or least experienced player in a context, and adding the intermingled bell (Adem) to create a stable two part unchanging multi pattern construct. Next comes the first supporting drum (Ampah) and subsequently the second supporting drum (Ansarbar).

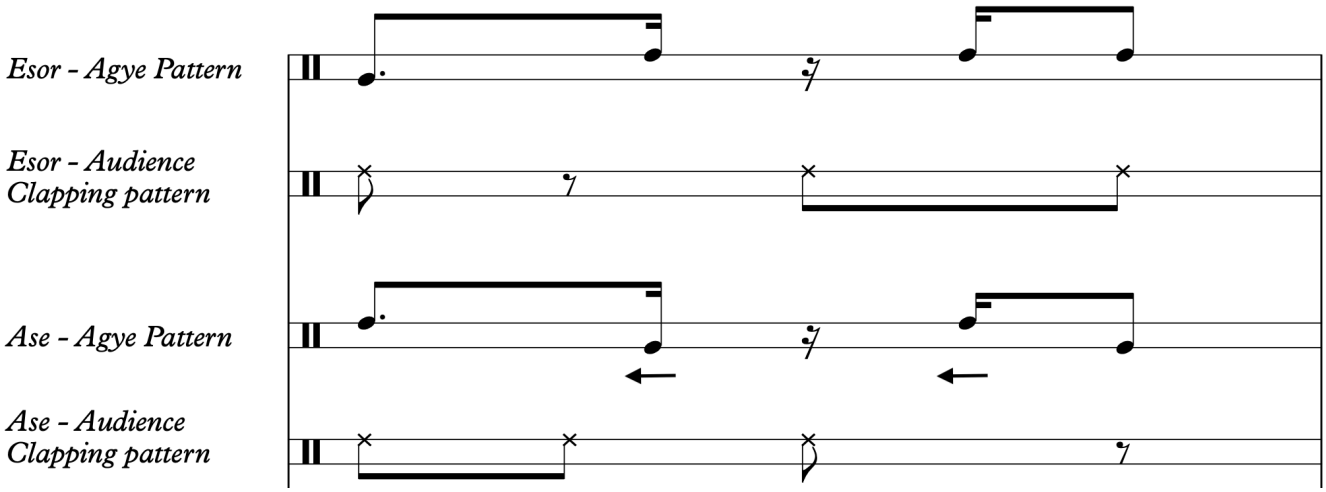


[Fig. 2 - Ensemble Groove Building in Pedagogic Context]

Eventually, the lead master drummer will begin to add his pattern to the groove, slowly stabilising the tempo and assessing when the ensemble groove instrumentalists *sound clearly together* (a term I borrow from Acquah (2014, 59) above, because it connotes the social aspect of groove building and keeping) as the supporting master drummer joins with his ensemble groove pattern as he sees fit.

In the case of the master bell, the player will sometimes retain his pattern from the texture until the exact right moment, according to his own assessment. This was e.g. the case in the Esor part of the recording for this thesis. In the Esor part, the Amponsa master bell is known to play some very long, stretched variations cutting across multiple timeline iterations, and the groove therefore has to be predictably stable for the master bell player to be able to time his patterns clearly.

Following the stabilisation of the ensemble groove, the participating crowd will start clapping a specific three onset pattern (see **Transcrt. 3**) that go with the Esor or Asé parts, and are known to any Asafo community insider.



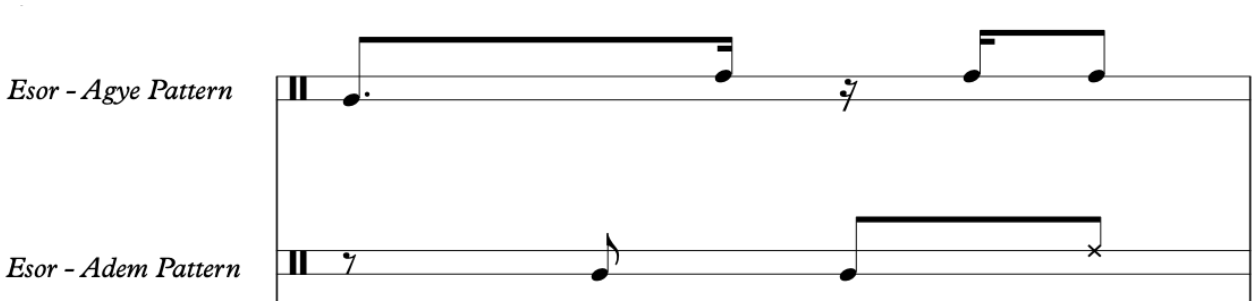
[Transcrip. 3: Esor and Ase Audience Clapping Pattern]

Lastly comes the level of dance rhythms, that represent a completely new and complex mode of participation, which I won't have space to go into in this thesis. Instead, I will only mention the fact that the isochronous pulsation often associated with meter is expressed purely by feet of the dancers and audiences.

As mentioned, all ensemble patterns are learned as speech drum sentences or its melodic analog. This also means that they remember their rhythms by way of a mnemonic coupling between tonal feature of Fante spoken sentence in speech drum constructs, before the pattern then is integrated into a given ensemble groove. These pattern relationships are several and many are not explicitly stated in lessons, but created by instrumentalist for "timing" or "leaning" their own pattern up against. In the following explication, I

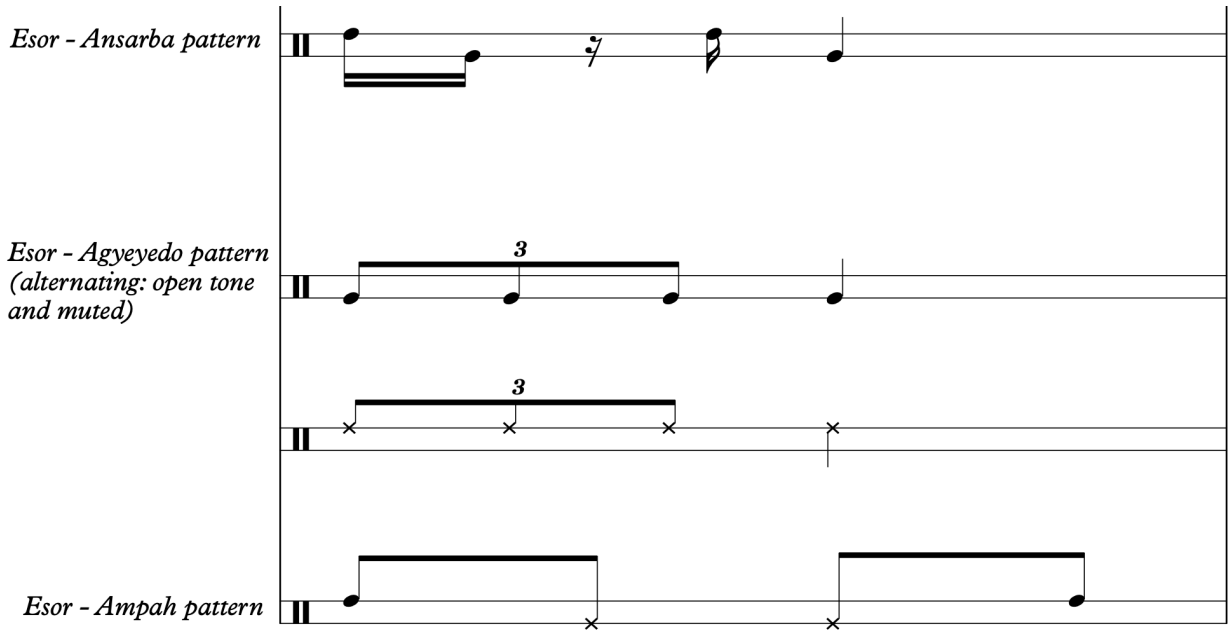
present the different patterns which are referred to me by Takyi as going into producing significant resultant melodic-rhythmic motives in the Esor part's groove texture, which will be the part which I will also use for the micro timing mapping and analysis later in this thesis. Meanwhile, Takyi underscores that this does not exclude the possibility of ensemble instrumentalists making their own resultant rhythmic motives up by listening and timing their own pattern with other significant patterns in a context. What is important is mainly to continually focus on relating one's own playing to the actualised patterns of other instrumentalist in the ensemble. This is sometimes necessary as master drummers often participate in the groove production, but suddenly stops and changes into engaging with improvisations together with other master drummers. This in tern leaves other instrumentalists to listen for a new melodic-rhythmic relationship for their patterns to become paired with and for the instrumentalist to "lean" their pattern phrasing/timing up against.

One central example (**Transcr. 4**) is the Agye bell, which plays the part of important referent structure - timeline pattern - for the whole Esor groove texture. Second to this is the Adem bell, whose name is taken from its function in relation to the Agye, translating into "intermingling pattern" (Sam 2014, 68). Here is an example of what is categorically thought of as an important composite relationship, which is kept for the majority of the Esor part, and rarely succumbs to variation.



[Transcr. 4: Esor - Resultant Melodic Pair 1 - Agye and Adem prototypical patterns]

In the Esor part, the Ampah goes on to relate to the Ansarba (**Transcr. 5**), which is also established by them getting their drum heads from the hides of a male and female antelope respectively. But while these rhythms are related to each other, an extra rhythm is interjected into this relationship, namely that of Agyeyedo (supporting master drummer), who plays the prototypically same pattern to that of the Ansarba, but phrases this in a significantly different fashion. More about this relationship to come in the empirical analysis of their ensemble timing.



[Transcr. 5: Esor - Resultant Melodic Pair 2 - Ansarba and Ampah prototypical patterns, with added Agyeyedo Prototypical Pattern]

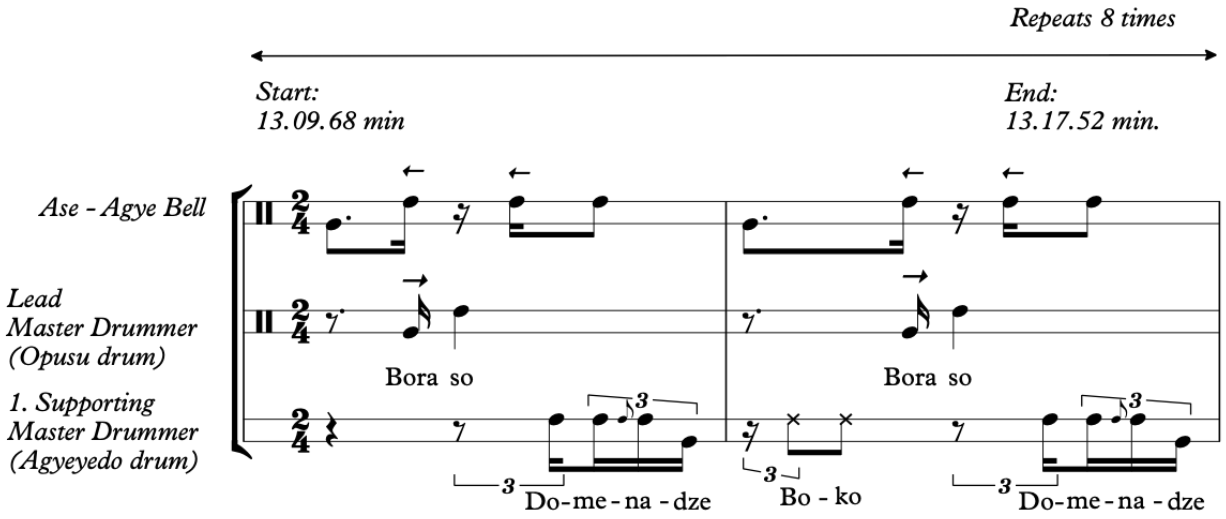
Dialogical Speech Drum Exchanges Between Master Drummers

In Asafo performance, all instruments have significant patterns that go together in specific functional relationships within the ensemble groove. This also goes for instruments handled by the master drummer, but these also hold a second function as a mouthpiece from which master instrumentalists express their speech drum and improvisatory parts - like the master bell, *Aponsa*, first supporting master drum, *Agyeyedo*, and the second supporting drum, *Amp*ɛ*h* and the lead master drum, *Opusu (kyen panyin).* These instruments inhabit a fluid identity between their function as instruments with prototypical rhythm patterns specific to the ensemble groove level of composition, and later on as mouthpieces for the master drummer that handles them. This functional change happens often during performance, where a master drummer stops playing the instrument's prototypical ensemble groove pattern, and starts engaging in a call-and-response exchange with one of the other master instrumentalists.

These exchanges are dialogic in nature, and are based on rhythmic patterns that are either recognized as talking drum sentences (or proverbs) or purely (melodic) rhythmic patterns, which are repeated, developed, call and responded to, in various interesting ways. These are mostly kept in time with the ensemble's metric cycle. Occasionally, a master drummer may break with the ensemble time and play in "free time" over the texture, without relating his stroke timing to any metrical aspect of the ensemble groove substrate. In the cases where these dialogic exchanges are made up by literal proverbial speech drum sentences, such are most often *called* by the master drummer and *responded to* by the first supporting

master drummer or the master bell player. As an example, one master drummer might make one part of a proverbial speech drum statement in the span of one timeline cycle, as the supporting master instrumentalist answers in the span of the subsequent timeline cycle or as part of the last part of the cycle. Alternatively, one speech drum statement might be started by the master drummer as the second supporting master drummer plays the ending "on top of"/"simultaneously" with it, within the same timeline cycle.

This leaves the whole sentence to be composed by the two co-occurring rhythmic patterns expressed by e.g. the master drummer and supporting instrumentalist. For an example of the latter, see **Transcr. 6** and listen to **Sound Example 3** in online appendix, which is a small example of a speech drum exchange between lead master drummer (playing the Opusu) and supporting master drummer (playing the Agyeyedo).



[Transcr. 6: Lead Master Drummer (Opusu drum) and 1. Supporting Master Drummer (Agyeyedo drum) Speech drum exchange]

Exchange translated:

Call: "Bora So": Appilation for the Anafo No. 2 company

Response: "Domenadze boko": "We will go to Domenadze" (Domenadze being a local village)

Sometimes, the master drummer (and supporting master instrumentalist) might also engage in dialogic exchanges of purely improvisatory rhythmical material (without any talking drum meaning). The nature of these types of rhythmic material is recognisable prototypes (to insiders) which are re-contextualised small segments of larger prototype rhythms which are repeated and mixed in differing order. Some

rhythmic patterns might be stretched over longer periods or are pushed so to become off-set relative to the timeline bell. Anku (2007, 19) goes on to break down these prototypes into "sets"; "the drummer structurally manipulates relatively few sets of rhythms. These set-rhythms employed in a particular musical context are often well known to the community of users. This of course means that the rhythms are not invented at the spur of the moment each time, but are drawn from a stock of generative rhythmic vocabulary associated with specific musical genres."

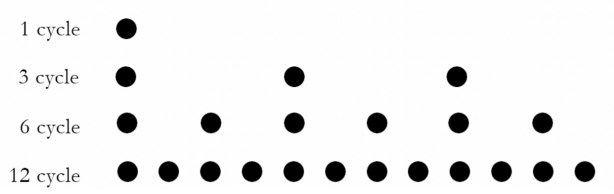
Before getting further into how timeline, instrumental patterns and downbeats are coupled and goes together in Asafo performance we need to address some questions to do with what is meant by metric, cyclicity, timeline pattern, accent and first of all rhythm in respect to musical analysis of timeline music and specifically West African ensemble performances like what is represented in this thesis, but also of music in general. The question specifically arises from the way instrumentalists compose together their instrumental pattern into resultant melodic pairs for relating their own pattern to a collective ensemble time, but further more how each pattern is never taught through its syncopated relation with a latent downbeat as instrumentalist seem to never actually express such beat structures through tapping of their feet or nodding of their head.

Chapter 2: Ungrounding of Meter and Rhythm

Meter and Metric Accentual Hierarchy as a Psychological Concept

As part of his seminal book "Hearing In Time" (2012), Justin London constructs a procedure for metric determination upon the foundation of Lerdahl and Jackendoff's system of metric well-formedness rules. This results in the formation of a set of wellformedness constraints, which he grounds in limits of rhythmic and metric perception and cognitive grouping tendencies of music listening. His effort is fuelled by an ambition to create a generalised conceptual model for metric organisation that "should apply to most of the world's musics" (London 2012, 114). In this model, London defines meter as a cognitively generated multilevel construct of recursive isochronous layers of beat pulses where in a minimum of one slower pulse strata, traverses at least one faster moving pulse strata, together forming a metric grid structure in a given musicians or listeners head, which then becomes the cognitive backdrop from which all sounding (phenomenal) rhythmic patterns are made temporally sensible. This metric grid, is hierarchized - meaning - self-enforcing by each strata of fast pulse cycles also being a pulse cycle on a higher (slower) level of meter (each referred to as N-cycles of meter), and these mutual reinforcing mechanisms are what make the listener's metric construct steady, even though one might be confronted with listening experiences where rhythmic patterns conflict with the metric pulses present in the

established grid. The layers follow a rule only allowing the slower moving pulses to be traversed by faster pulse trains, sub-dividing the full cycle by a factor of duple or triple.
These multiple levels of pulsation are presumed to have a hierarchized interdependent vertical relationship, causing an accentual hierarchy to be "thrown off" on specific horizontal beat positions, receiving a phenomenal classification as strong metric position in relation to the weaker ones surrounding them (in the experience of a listener or musician), from the epiphenomenal forces taken to cognitively emanate from the metric positions occupied by most co-occurring pulses across all metric strata. In other words, the number of co-occurring pulses allegedly causes these positions to become cognitively weighted or *marked by consciousness* in some significant way - modifying Cooper and Meyer's (1960) earlier term *marked for consciousness* (London 2012). To illustrate this, London, like Lerdahl and Jackendoff, employ a "dot" representation (Fig. 3) of this multi-layer model of traversing metric pulse strata and accentual hierarchy, to be able to relate an unsounded meter to structures of sounded musical rhythm.



[Fig. 3: "Dot"representation]

Justin London (2004) places these structures of meter and accentual hierarchy in a distinctly separate category from that of all rhythm structures of music, namely that of psychological reference structure for rhythms to become mensurable up against (coupling these strata through idiomatic cues in the musical surface level). In doing this, he leaves very little epistemological wiggle room for dealing with a wide variety of musics that, structurally and micro rhythmically, fail to conform to his cognitively grounded claim of nominal isochrony. Furthermore, very little attention is given within his theory to the multiplicity of affective relationships being had between the rhythmic patterns (players) in the music. What is offered for understanding and dealing analytically with more fluid, flexible and/or irregular timing patterns, are as features of beat level syncopation and micro rhythmic expressive variation engendered only by their "divergence from" or "syncopation against" metric pulsation on various strata of meter.

By London making a sharp divide, separating rhythm and meter into two entirely different ontological realms, he subsequently raises the question of what then has multiple people entraining similarly to the same musical material, and why doesn't one constantly shift metric perspective when listening to new musics, if meter is so loosely tied to phenomenal categories of rhythmic structure?

In the search for a more analytically rigid method for coupling rhythm and meter, some theorists, like that of Maury Yeston, Cooper and Meyer and Lerdahl and Jackendoff, have previously explored their respective version of a fundamentally similar approach to establishing rhythm perception on a generative principle. This is grounded in smaller events in basic phenomenological class criteria, working to infer accents, structures, groupings and lastly to organise rhythmic structures into bigger and more complex constructs of rhythm, which also in turn, imply or include non-sounded features of meter - or more specifically metric accentual hierarchy.

Identity, Reproduction and Rhythm

[The study of rhythm]; *"has been hampered by a failure to distinguish clearly among the several aspects of temporal organization itself. The resulting confusion has created a correlative ambiguity of terminology. Since clear distinctions and unequivocal terminology are necessary if the analysis of the rhythmic structure of music is to move beyond its present moribund state, our first task must be one of definition." (Cooper and Meyer 1960, 1)*

Before taking up the mentioned authors' specific approaches to rhythm and meter relation, I wish to dwell on the challenging feat of defining rhythm in the first place, and thus also in determining what can be said to constitute the basic events preceding any attempt to formulate a generative approach to music analysis. For the sake of saving space, I just wish to mention some basic reflections to do with the ontology in the field of music theory.

Stover (forthcomming, 38) cites some examples of rhythm definitions, gathered by Godfried Toussaint's in his 2013 works "The Geometry of Musical Rhythm", as he makes the point that even the simple task of defining rhythm seems to cause problems for many researchers of fields like that of; philosophy, psychology, mathematics, music theory, and ethnomusicology. In extension, he cites diverse definitions of rhythm proposed by e.g. Nichomacus; "well marked movement of times", Jeanne Bamberger "the many different ways in which *time* is organized in music", John Clough et al. "patterns of duration and accent of musical sound moving through time", Cooper and Meyer's "the way in which one or more unaccented beats are grouped in relation to an accented one" and Simha Arom "for there to be rhythm, sequences of audible event must be characterised by contrasting features".

What he emphasises by highlighting this wide variety of both general and very specific definitions of rhythm, is the way in which a good part of their shared ambiguity seems to stem from "the very project of attempting to define, categorise, or otherwise limit terms that might be best thought through as lively concept-constellations, ever in motion and subject to deflection in a variety of directions" (Stover forthcomming, 29-30)

What to him epitomises the problem facing the music theoretical and music cognitive projects, in turn emanates from the conceptual problems many authors run into by allocating metric events into the category of "psychological", and rhythmic events into that of "phenomenal". This problem equally applies to the categories of weak or strong accent of rhythm and meter respectively, and in relation to each other, as well as the notions of sound versus silence as two separated categories of event and non-event.

Instead, Stover suggests a fundamental re-orientation of the ontology informing the epistemological grounding of the music theoretical project, by invoking the powerful thinking presented in Gilles Deleuze's seminal meta-physical work; "Difference and Repetition" (2004).

What intern Stover, as well as other authors occupied with micro timing analysis (Danielsen 2006, 2010, 2012) suggests, is the way our understanding of identities can't be grounded in an ontology based on a conviction that everything can be represented as static essentialistic identities. Instead, Deleuzi'an thought insists that even the most essentialistic identity, in reality, relies on the existence of the differences, separating itself from identities of others just as supposedly essentialistic concepts. Stover invokes the Deleuze'ian term of *Simulacra*, which establishes even the most seemingly fundamental identity as only a copy of a copy, without an original (Deleuze 2004, 67). Here Deleuze refers to the collapse of Platon's *ideal forms* that build their identity on *myths* of e.g. that which is *beautiful,* while themselves *participating* as the *original forms* (of e.g. that which is *beautiful*) represented in such myths.

This leaves every conceivable identity to be thought of, as only a copy which is reproduced and thus repeated and reinvoked, if it receives status as comparably important in memory (involving notions of ethics), and is always only determined important by its continued ongoing reproduction as an identity by a subject (a subject internalising this, naturalising it, making it common sense).

By eliminating the fundamental notion of any identity being fundamental to any other identity, Deleuze deduces that what must lie behind the surface of identities is a fundamental *ontology of difference*, and thus additionally a basic recognition of epistemology as something which must be recognised as *ethical* in nature. This effectively means that to reach the certainty of what can be considered fundamental identities within a specific analytical project, one needs to decide who is doing the analysing or in the case of the Asafo performance, whose acting and experience we try to theorize about.

For analysing, one thus has to think of any object as something which recedes in two realms simultaneously; the *virtual* and the *actual*, merging to become the *real* (becoming a *real object*). For an identity to be known as a *real object*, it has to participate in a double movement wherein important forms of the *actual* (in music context, that which is sounding) are always conditioned by a subject's (or a society or culture as a performative body in its own right) active engagement with reproducing them as identities in the *virtual* (in music analytical context, Danielsen (2006) describes the virtual as the musical interpretation and experience residing in the head of the subject, and thus in a comparative sense "non-sounding" realm of music), spelling out what in turn may be termed the *real.*

In other words, what constitutes every conceivable identity is its constant participation in this double movement, which restates identity as something inherent to and inseparable from the process of reproduction, constantly being re-formed and re-stated (repeated).
In a musical context, such restatement, in turn, is what could be called a repetition of gesture (e.g. sounded rhythm), in the strict sense "that which is being repeated/reproduced in a sounding gesture" is "the virtual reproduction of what earlier was sounded in the mind's ear of the listener" (which by Danielsen is also referred to as virtual figure). As the subject goes on to repeat the former sounded gestures, what is really being repeated is the virtual representation (or virtual figure) produced by the subject, and builds on their perception of the gesture formerly stated, thus constituting the double movement which makes up the process of identity formation.

Even more important to the notions of musical gesture and figure, is that they are constructs becoming affected and made meaningful because of their relation to other elements of both fields, every time they are reproduced within each realm of the *real*. For example, a particular bell pattern becomes engendered as rhythm through its ongoing affective relations to other identities of the *actual* like; inter-instrumental rhythmic relations to other patterns (which are important to this analysis), melodic trajectories, harmonic implications, micro timing relations, timbral characteristics etc., as well as virtual constructs like meter, accentual emphasis', and even the fundamental recognition of rhythm as a rhythmic figure and not as a non-rhythm (noise, non intentional acts outside of a musical context). But it is not before we understand them as real objects existing in this liminal space between actual and virtual, that a meaningful analysis may begin to take place.

No identity can be seen as existing outside of this process of identity formation. What one considers to be important identities for experience (and in explaining experience), will be taken to be influential within any field of identities, and will thus also be reproduced until an ethical change is made, actively deeming this identity less important in producing a certain context.
This means that any rhythm (or any musical identity at all) can be said to only exist as something inseparable from its placement within this double movement, and by way of becoming *gesture*, which then is restated as virtual *figure* and later reproduced as *gesture* again. Thus, this necessarily must be seen as something which belongs in both fields at once, as aspects residing in both fields that also necessarily impact and constitute the formation and re-formation of this particular rhythm as an identity - as an idea. While the initial ideal of regulatory pulse cycle's - like meter - are convenient as constructs, thought as fundamentally psychological, such a distinction is not viable, as the affective relationships shared between rhythmic structures and metric cycles is something as present in the actualised state of the rhythmic pattern and sounding musical texture as a whole, as they are in the experiencer's virtual realm, underscoring the implication introduced by notion of there being a shared field of *real*.

All of this is very much summed up by Christopher Hasty's theory of Meter as Rhythm, which will be outlined in the following chapter, in relation to timelines and their meter-like nature in Afro and Afro-

diasporic musics. While I don't claim to do an exhaustive work in understanding the full scope of musical identities and affective forces governing the creative process of the Asafo musical performance, I seek to take a significantly more multi dimensional approach to music theorising, than that taken by some earlier authors, and bring these to bear in my analysis of the Asafo as presented to me by well versed insider performers.

To come closer to such an analytical approach, which also addresses the special status of a timeline pattern, I wish to firstly engage with some earlier theories experimenting with coupling simple phenomenal categories of music with meter, to establish some point of departure for thinking about these in bigger contextual terms, like occasion, and as structures which are part of experience as inseparable from the process of time.

Music Theory in the *Real*: Phenomenal Event Classes, Virtual Meter and Musical Surface

I wish to interrogate some concrete examples challenging the widely held belief that metric determination is something only psychological in nature, or that rhythm can only be conceptualised as something residing in the phenomenological realm of sounding music. Therefore I wish to return to the realm of music theory, and build my argument on some concrete theoretical assumptions made in some of the most influential theories on rhythm and meter.

I choose to engage with the theoretical experimenting done by mainly that of Mauri Yeston, Fred Lerdahl and Ray Jackendoff and Grosvenor Cooper and Leonard Meyer, who take on the task of formalising the relation between rhythm and meter. Common for all these approaches, is that they all ground their analytical convictions in a meter which appears from some fundamental generative process, as musical rhythm is "deciphered" by listeners. By this I mean that all models in some significant way, identify discrete categories/criteria which can be said to constitute classes of phenomenal events (features of attention-grabbing nature), and together infer accentual strong points in the music surface level, which in turn help to determine both rhythmic grouping and meter.

Yeston labels these *event class criteria*, as Lerdahl and Jackendoff employ the term *metrical preference rules* (MPR), and Cooper and Meyer works from a model making all rhythms a product of five basic *prosodic* double or triple note groupings.

Grouping and accent

In terms of rhythmic grouping (Yeston's *rhythmic structure*), both Yeston and Lerdahl & Jackendoff build their approach on the basis of similar criteria, which means that; rhythmic groupings can only be constituted by two or more pitch events or drum beats (to Yeston, *attack point rhythms (1976, 39)*).

When grouping onsets of music into rhythmic groupings, Lerdahl and Jackendoff mostly take a linear approach, working to exhaustively partition bigger groups by smaller ones, and the idea of overlapping rhythmic groups is unthinkable except for very special cases dealt with in their section about *transformational rules.* In determining grouping, it is primarily done on the basis of simple gestalt theoretical principles of *proximity of notes* and *symmetry*, but also involves inferring accents to specific phenomenal classes of events on the musical surface like *register*, *dynamics*, *articulation*, *note length.* Furthermore, special regard is taken to group events into structures which support *stable time-spans,* over non-stable ones. These different event classes, if regular enough, might become explicated to their own strata of motion, which then in turn becomes a factor in determining right grouping, and perhaps later, right meter (Lerdahl and Jackendoff 1983, 43-63). While Yeston also follows the gestalt theoretical grouping ideas, he also allows for thinking about multiple interpretations of *rhythmic patterns*, wherein multiple rhythmic groupings intersect at different points, but one is finally determined as the most experientially prominent grouping when also determining which metric structure that seems to be most strongly inferred across the several analytically identified structural layers *(Yeston 1976).*

Phenomenal Event Classes and Meter

For inferring meter (or establishing rhythm and meter relations), Yeston builds on a foundational conviction that "[…] any single level of motion remain uninterpreted so long as it is isolated from and unrelated to any other level of motion[…]"(1976, 77).

Thus, Yeston's approach to determining meter is done by explicating recurring structures of one event class criteria (say dynamics), into what he calls a *level of motion* isolated as a *sub-pattern* present within and influential (to some degree) to the overall piece as a level of motion in its own right. Meter is inferred by assessing which sub-patterns work together to create most structural consonance, and hereby highlighting certain positions across rhythmic groupings as significantly more worthy of becoming salient as a metrical accent. This, in turn subverts all other grouping accents to the position of less important to the process of structurally interpreting a given piece.

Similarly, Lerdahl and Jackendoff, choose to list such phenomenal event categories/criteria as part of their metrical preference rules (hereby pointing out specific phenomenal events as important features for metric determination, which is an assumption we return to shortly). In the case of Lerdahl and Jackendoff, these rules outline which phenomenal event classes of the musical surface - some of them also used to group onsets into rhythms - that go together to infer stable meter and metric hierarchy (here referring to meter as

a psychological construct, like that described by London - an internal cognitive construct that is recursive in nature, and governed by the gravitational pull implied by the epiphenomena of accentual hierarchy emerging from the metric hierarchy construct) (Lerdahl and Jackendoff 1983, 68-96).

While the previously mention authors' event class criteria/metric preference rules both constitute a similar field of phenomenal classes (later also added to by other authors), that to both theories are deemed fundamental to any type of structural music analysis at least within the category of notated Western Euro-classical art music, pre-1900 and the modernist era.

In the coming section, I wish to question the axiomatic assumption taken to make these event class criteria quasi-universally determining in the inference of accent (and thus also meter) in (pre-1900) Western Euro-classical music. Furthermore, using examples from a range of diverse musics, I will question that even the simplest assumption that metrical accentual hierarchy necessarily needs to be inferred by sounding phenomenal categories like stress, long notes (agogic accent) and beginning accent. I will go as far as to claim that even the simplest notion that accentual hierarchy necessarily needs to be coupled to the phenomenal category of "sounded event", is something of a theoretical overreach, when not knowing several other factors important to a musical insiders.

For clarity, I choose to highlight the most mentioned phenomenal event classes and event criteria which are defined similarly by both previously mentioned theories (also I choose only those which don't connote tonal pitch scale relations):

- Event (meaning sounded event/attack point - categorically excluding silence as an event)
- Dynamic intensification (sometimes serving as the definition of *stress* as a distinct phenomenal event class)
- Length (long notes)
- Register (relatively big change in tone register, or *tone colours*, as suggested by Arom (1991))
- Timbre (categorically differing sounds)
- Pattern recurrence (Patterns symmetry - repetition of rhythmic grouping)

Event Classes and Context

While these classes work (somewhat) for analysing rhythmic structures of specifically notated music examples of 18th Century Western classical art music, such examples only represent a tiny sliver of all music performance practice worldwide. What is necessary to mention is the ways in which these analytical approaches fundamentally are coloured by the particular musical practice and its specific modes

of theorising, representing and composing which obviously impact their choice of phenomenal event classes, working to infer phenomenal accent and metric structure in a given surface level musical texture. This is exactly the case with Yeston and Lerdahl & Jackendoff.

Accent

Firstly, I wish to question the universality of several relations which are claimed to exist between some of these phenomenal event class criteria and that of *accent*. One such relation is that which is held to exist between metric accent and the dynamic intensification of a surface level event, the latter referred to as *stress.*

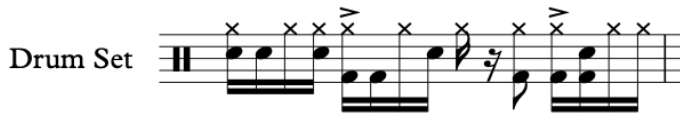
I wish to dispute the general assumption that stress as a phenomenal event can be said to be coterminous with an accent in any given musical surface. This position I share with, among others, Leonard Meyer (see also Cooper and Meyer 1960), who states that stress in no way can be said to universally designate points of accents in either surface rhythmic grouping, nor when inferring metric structure.

> "Accent should not be confused with stress. As observed earlier, silence may be accented; the literature of music is replete with examples of pianissimo accents. Stress is the dynamic emphasis of either an accented or an unaccented tone. Where an accented tone is stressed, the stress may change the rhythmic grouping or may help to clarify an otherwise ambiguous rhythmic organisation, but it does not create the accent. Nor does stress placed upon an unaccented beat alter the rhythmic grouping. Such a beat is still perceived as unaccented, not only because of the tendency of a given grouping to perpetuate itself, but also because, as we shall see, the placement in the temporal organisation, of an unaccented beat, whether stressed or not, is physically different from what it would be were it really an accent." (Meyer 1961, 104)

London (2004), makes this exact mistake as he argues that dynamic intensification (stress) necessarily is the event class criteria which infers metric accent to positions within a listeners experience of a rock beat. In his example he exemplifies that rock's signature backbeat, provides a dynamic intensification of metric beat positions 2 and 4 by the drum set's snare drum which works as a genre idiomatic identifier for listening insiders to place the metrical strong beats on the preceding beats 1 and 3 (where the bass drum generally resides).

This claim of stress being the phenomenal event class that indicates metrical strong beat in generic rock rhythm, can be questioned by an example from my own musical experience, playing Afrobeat music with trained rock and pop musicians in Denmark. In playing the Tony Allen Afrobeat drum set groove (**Transcr. 7**) underlying Dele Sosimi's (former pianist for Fela Kuti's Egypt 70) classic modern Afrobeat

hit “Di Bombs”. In this context, an alternation happens between non-stressed snare drum strokes on metrical beats 1 and 3 and accented bass drum strokes on 2 and 4. In this drum rhythm the position of the stressed onsets are still at the position 2 and 4 in the rhythm (like with the snare back beat in rock) only now the musicians still compulsively interpret the 2 and 4 position as 1 and 3, questioning the claim that it should be stress which is the determining phenomenal event inferring metric strong beats in rock and pop musicians in the first place. Instead, it might be suggested that it is the timbral quality of the bass drum that in a rock context works as a genre idiomatic identifier for right placement of metrical strong beats.



[Transcr. 7: Tony Allan style Afrobeat Drum Groove, from “Di Bombs” by Dele Sosimi]

Stover suggests that incidents like these might be explained by the musician’s understandable, but misguided assumption, that a certain musical index (of event class criteria) will carry its semiotic association across musical and cultural boundaries. In a Western popular music setting, bass drum is associated with downbeats, and with beginnings, but as one turns to samba the *surdo* (deep sounding drum) places its very prominent strokes on beat two, which for many outsiders will result in a flip of the perceived beat and cycle beginning point (Stover 2009).

This point goes towards a theme that is central to this thesis, namely that musical objects are not determinable unless one relates them to an enculturated listener or what Stover calls an insider “I”. Anku talks to this fact as he states:

> “when we hear rhythm without any preconceived beat indications, there is a natural tendency to assume a self-determined perception based on our memory of a previous experience. Hearing therefore is subjectively conditioned by our choice of perception. This, of course, does not necessarily represent the way the rhythm is transmitted, resulting in an obvious disparity between the perception of the transmitter and that of the recipient.” (Anku 2000, Par. 16)

On this same note, as also stated in the quote by Meyer (1961) above, even the widely held assumption that attack points can be said to hold exclusive status for inferring the accentual strong points (or downbeat) of meter, can be challenged with ease.

As an example, Stover points to the fact that many non-Western traditional musicians will speak of a downbeat even if nothing significant (or even nothing at all, in some cases) is occurring. This goes for e.g.

“reggae musicians speak of the “one-drop”, literally meaning that the first beat is “dropped” and nothing of any real consequence happens here” (Stover 2009, 42). He additionally mentions the fact that “most melodic phrasing in jazz, avoids downbeat beginning and endings[…]” in the effort not to be labelled “square”, meanwhile in both of these traditions there is clear talk of a downbeat as band leaders count off “one, two, three, four” and so on (ibid 42).

Stover himself makes a great explication of the rumba guaguanco’s (clave) timeline pattern wherein its second (2 side - 3 side) rotation of the pattern has a metric beginning point (or to him, cycle beginning point, as he on purpose chooses to conflate the term metric and cyclic) at a point in time of silence in the clave pattern cycle. Stover invokes Barbara Browning’s notion of the power of silence, inflicted on dancers by such syncopating forces, as she in the different context of Samba says, “[…] the (metrically) strong beat is suspended, the weak accentuated. This suspension leaves the body with a hunger that can only be satisfied by filling the silence with motion” (Browning 1995, 9-10).

Agawu agrees with this depiction of silent downbeat, as he says “it is not that nothing is happening in the downbeats, but rather that that something is silence”. He exemplifies this when he describes the offbeat pattern’s place and use in Ghanian highlife music;

> “By articulating the off-beats only of beats 2, 3, and 4 in a 4/4 meter, the *topos* maximizes the energy in the margins and enshrines a potential for movement […] listeners know where the main beats are and so coordinate foot movement with these unsounded parts of the *topos*. The dancer thus becomes active interpreter, contributing to the implementation of the pattern. Of course, in the case of dance-band highlife, the unsounded parts of the *topos* may be sounded by other instruments or voice; the background is thus activated. Whether the background is assumed or externalized, it remains an indispensable dimension of the music” (Agawu 2003, 130)

London, comes to the conclusion that even though surface level phenomenal accents (which he states are significant to the listening experience, and to a listener’s metrical entrainment, though not in any universally deterministic way), don't universally designate musical meter, he never goes on to suggest “what then” might be features that determine meter or even support the claim to universality held by his metric model of accentual hierarchy.

One defining feature of meter is that it implies a specific hierarchy of accent and non-accents, and even though it is certainly a convention of many performance practices to assume an isomorphism between metric construction and a hierarchy of accents, it is not by any means necessary for that isomorphism to be present. To challenge this, Stover cites a few examples from the Western classical music canon, which

challenges the assumption that a metric downbeat deserves an accentual emphasis to be termed, in effect, a downbeat. This goes e.g. for the agogic accent on beat two of the Viennese waltz, which constitutes a performerly consideration that is not reflected in the notation, but which is an important determinant of correct performance, to insiders. Secondly the dynamic accent on the three of the gavotte (also a beginning accent according to Joel Lester (1986, 37)). Furthermore, he states; "there are so many diverse examples of dances that subvert a beginning-based conception of metric accent, that it seems suspicious to claim any *a priori* primacy to beat one or any other part of the metric rubric" (Stover 2009, 37).

Stover in his forthcoming work "Timeline Spaces: A Theory of Temporal Processes in African and Afro-diasporic Music", doubles down on this viewpoint, citing multiple authors like Jonathan Kramer who maintain that while different kinds of accents (metric or phenomenal) might coincide, they are "quasi-independent structures that function in different ways. Until metric and rhythmic accents are clearly understood, even something as basic as the accentual patterning of a normative four-bar phrase remains problematic" (Kramer 1988, 86, cited in , Stover forthcomming).

In his influential work "Meter as Rhythm", Christopher Hasty problematises all together the basic notion of metrical beats as durationless instances, that accentual hierarchy is inherent to meter, and that meter can be seen as occupying a separate position outside the realm of temporality, from that of rhythm. He presents the conundrum of the generic meter construct, made up of periodicities, that are predetermined (annihilating times arrow) by all of its points being stated together and always already determined by their internal recursive relation to each other, even though they in reality are realised consecutively, just like rhythms, as part of music as a temporally bound process.

The problem for Hasty in accepting meter as epistemologically separate from rhythm, lays in meter's apparent determinacy and homogeneity. The measure, like the time it measures, becomes a receptacle - a container of events - and the duration of the measure is a potential for division. Yet again, unlike time, the measure itself is an event, and this measure happens *in* time, like what it itself is measuring, rhythm. These two constructs from their conceptions, are incompatible.

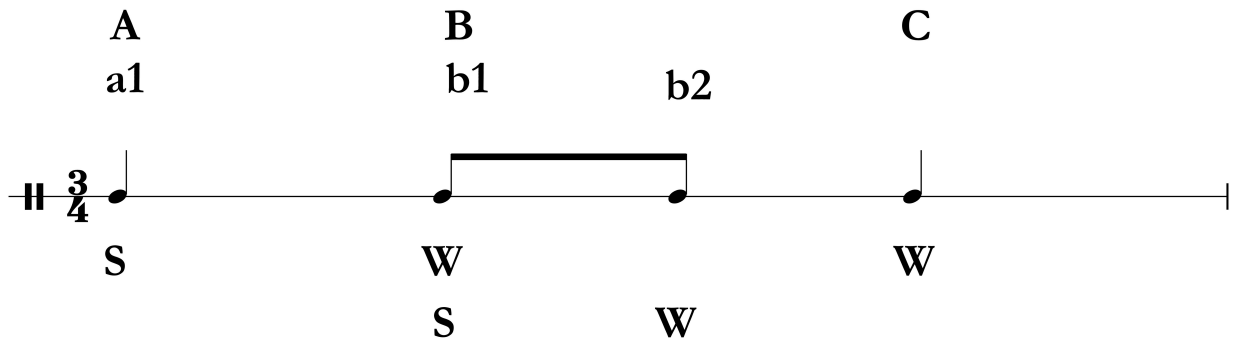
To the point about metric accentual hierarchy being incompatible with music as a process, Hasty again points back to the same fact, as stated above. Common music theory conceptualises meter by stating all beats and pulses together, and at the same time. As a container marking out durational quantities and also accent, by the logos of regular alternations of strong and weak, duration-less beats. On the basis of these, there becomes possibilities for conflicts of meter and rhythm, if the metrical distinctions of strong and weak are not coordinated with forms of accent that can be regarded as "rhythmic". There is no doubt that rhythmic accents might, sometimes, work to reinforce or intensify metrical accent. But rhythmic and metrical accent must be different in kind, otherwise rhythm, in this sense, would be distinct from meter only when its accents are not coordinated with those of meter.

Metrical accent is fixed by meter signature, which prescribes a homogeneous order of accents but, according to Hasty, there is a fundamental difficulty in attempting to wed the qualitative category of accent to the concept of meter where time points are duration-less and stated together dividing out a predetermined metric periodicity. What is a mystery to him is how a qualitative distinction of accent can be without duration; "a distinction that somehow touches our sensibility to the extent that it is capable of actually conflicting with rhythmic accent. Certainly, meter is not perceived directly or immediately—we have no sense organ for meter […]?" (Hasty 1997, 17)

This makes Hasty conclude that, for metrical accent to be theoretically palpable, there needs to be a metric construct made up of durational events, for the listener to be able to "extrapolate" metrical accents from aural cues that are not nothing. Furthermore, he points out that because of the dubious perceptual and ontological status of the duration-less metrical accent, it is not at all clear whether accent is the cause of meter, or a result of meter's autonomous regularity. Having argued that accent in meter can't be happening if beats are duration-less timepoints, he goes on to highlight the paradoxical nature of meter if defined as the alternating values of accented and unaccented beats, if the notion of beats having duration is taken to apply.

He exemplifies this by evoking the notion of two values; strong and weak, or accented and unaccented beats, and subsequently that of the three positions in a 3/4 meter (A-B-C - in Fig. 4) - position: first, second and third. All first beats are accented as first beats (and metrically identical as first beats).

"First position" and "accent" are to be considered as interchangeable expressions. Second and third beats are unaccented (metrically identical as second and third beats). Fixed to each level, metrical accent is variable only in terms of higher or lower metrical order, as an alteration of the relative position of a beat. He exemplifies how the point of accent for the second quarter note beat of a bar of 3/4, though weak for the bar by virtue of being second, is in fact strong as the first of two eighth-note beats. He adds "strong, that is, by virtue of being first" (Hasty 1997, 18). In other words, by considering metric beats as duration, for them to be able to receive accents, it opens up the paradox of all beats being both strong and weak as they occupy more than one relational role on different levels of metric hierarchy (Hasty 1997, 18-19).



[Fig. 4: Hasty'ian Accent Hierarchy Figure]

As mentioned above, the simple notion of accentual hierarchy and the recursive nature of meter inhabiting a realm away from that of the actual, has serious implications for our theorising and experiencing of music. The idea that any musically determining concept should precede the unfolding of the music itself, and take on a universal status as a naturalised attending mechanism, can be said to have far reaching implications if taken at face value by wide populations and internalised as part of their approach to experiencing and subjectivising music. Stover talks to this point, and underscores the notion that any theorising about proper phenomenological engagement with music must necessarily be understood as ethical in kind.

> "I do not believe that most theorists of rhythm and meter are thinking very seriously about the political stakes of various claims about the relative given-ness of metric strength, whether projected onto the music as a cognitive framework or emerging from phenomenological attention. At any rate, what makes this an epistemological matter is that the double movement through which a listening orientation is at once revealed and shaped through contextual contact with an object of musical experience suggests a process of coming to know that object "as and how it presents itself." It is for this reason that this process (and any act of phenomenological engagement) is ethical as well." (Stover forthcomming).

What will follow in the coming section is a widely different approach to the musical analysis, from that based on notational musical object and large form architectural compositional projects, but instead approaches music as a temporal object, processual and involving multiple creative contributors. It is an approach which looks at musical unfolding and understands structures as successive statements in time, which necessarily are born out of the past, formed by expectations, and undergo transformations through the relations to what is expressed after. It doesn't exclude the analytical depth gained through structural analysis of rhythm prototypes in notation, but always insists on returning such into the flux of processual becoming, given what was previously explicated about all identities (though given to rhythms) always being defined by the relations and affective forces it can be said to hold and exceed onto other identities making up a given musical context.

Firstly, I will outline the basics of Christopher Hasty's music processual theory of projection, which work to outline a model of rhythmic experience wherein meter does not hold a separate position (or inhabit a separate realm) from that of rhythm - but that they are given together in experience. Furthermore, I wish to couple this to the mediating concept, of call-and-response, which can be said to inform the teleological nature of performance-in-time in many Afro and Afro-Diasporic musical processes.

A Theory of Projection and Music as Process

Hasty describes the temporal aspect of music, as a; "totality of discrete elements joined through a system of relations or transformations" that "flow together as a whole, diversified but unbroken”" (Hasty 1997, 67, also cited in Stover 2009, 180).

Central to Hasty’s theory is that any musical experience is never given outside of time, and thus music needs to be analysed as a process and not as fixed periodicities and always already determined recursive metric reference structures.

According to Hasty, rhythm’s qualitative character of motion is constituted by multiple events, or as structures being mutually conditioning as parts in a larger context, this context being firstly rhythm and also as part of bigger and more complex ensemble textures. To make this notion a little more illustrative, one might think of two sounded events, wherein one is stated before the second. Following Hasty’s train of thought, these two sounded events are in isolation identical, but by placing them in a context (as part of a successive structure in the flux of time), we become able to distinguish them and subsequently ascribe a qualitative character of motion to them, restating them as one unit. Hasty writes:

> “[…] if we are able to perceive the two tones as a unit (that is, as a duration) the immediate qualitative change introduced by the second tone must be thought of as permeating or "spreading through" the two events as a mutual conditioning or relationship, imparting to both tones an order. The continuous change of the first tone becomes a particular qualitative change as it approaches the second tone. The duration of the second tone likewise receives an order to its continuity as it recedes from the first (and progresses to the third).” (Hasty 1997)

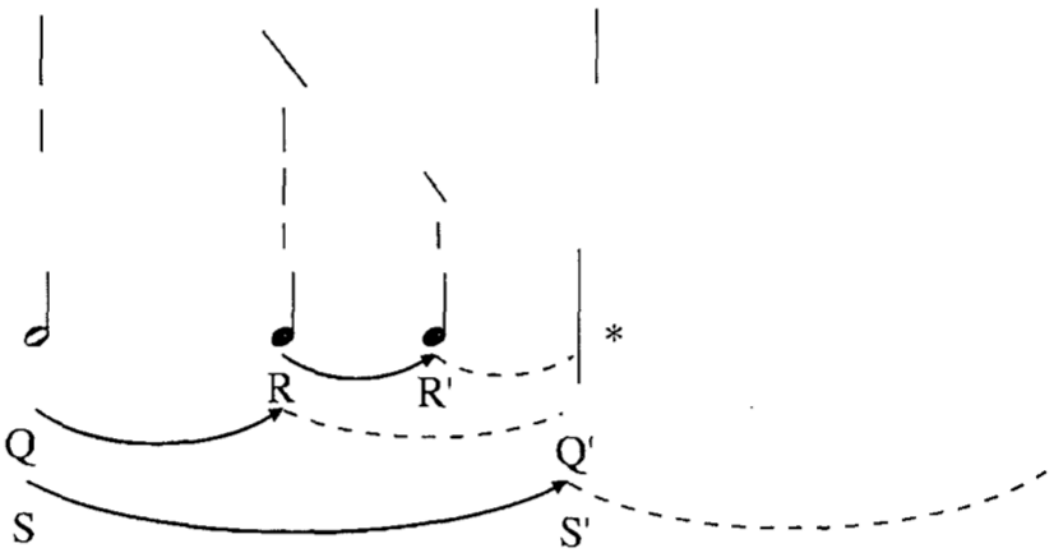
This means that every event is identical before it is seen as part of a context of rhythmic unfolding. As one onset is begun, its qualitative character is not known before it gives way to a second event beginning (a second stroke), mapping out the first event as a qualitative actualised duration, inferring a motional qualitative character to the two events as a structural unit. Meanwhile this two-part unit can't really be said to be constituted as a unit before one knows of the second event’s durational quality, only disclosed when it gives way to a third event beginning.

This fundamental notion is unraveled into a bigger picture, as Hasty adds to it, the element of durational projection and the notion of insider listener expectation.
Firstly, durational projection works in this way: One *event beginning* is transformed into an *actualised duration*, as it gives way to the second beginning. This now actualised duration simultaneously works to measure out the duration of a *projective potential* that becomes the template for a listeners *durational projection* for the actualisation of the second beginnings event. Should this second beginning be

actualised in accordance with the durational projection, this would then constitute a structure of (now) a two durational unit in a contextual relationship, creating a projective potential for a even larger durational projection. Hasty takes these principles and introduces them into a more complex model, outlining the progressive implications of rhythmic structures made up of multiple events of different durations (like the one shown in Fig. 5). Here, we see both smaller actualised durations (like a quarter note) that in turn work to measure out larger actualised durations, like that of the half note or whole note durations), making them more mensurably determinant. In these more complex contexts, according to Hasty, larger durations (like S) are transformed into a special form of projective potential, namely one of (metric) cycle, finalising his processual model of *metric projection*. What this in turn implies is that meter necessarily must be given as rhythm, because they are both structures born into a time as process.

What in the musical surface works to outline metric projection depends on the expectations being had by an insider listener. As an example, in the context of timeline musics, such metric cycle is fundamentally yoked to a phenomenologically special instance in the timeline pattern and maps onto it a downbeat structure. This instance, meanwhile, is determined by some more complex relations dictated by the insider's ear (which we will come back to in detail).

In the illustration underneath, one can see a visualisation of this concept of durational projection. Solid lines being actualised durations, and dotted lines being their non-actualised projective potentials and following projective durations.



[Fig. 5: Hasty's example 9.5A]

In Fig.5 , the duration S that composes out as a half note Q, followed by two quarter notes R and R' (the latter of which is a realised projective image of the former, and the pair together representing the duration

of Q', of an also-realised projection) possesses the potential of an as-yet unrealised S' (that when realised becomes transformed from durational projection into actualised duration) (Stover 2009).
While Hasty generally implies that the smaller quarter notes R and R' don't project onto the larger projective potential S'. This is due to the fact that, after hearing S, we predict a continuation of the entire duration as a single rhythmic gestalt, that overrides any consideration of an R's continuation, into the beginning of S'.

On his way to a non-grounded projective theory of timeline music, Stover meanwhile reproduces Hasty's model but instead of a larger durational projection (like that which becomes a metric projection) being mutually excluding of smaller ones, he suggests that all projective potentials should be considered fully compatible, as smaller projections effectively serve to make bigger ones (S') more mensurably determinate, since on its own it might be too long, cognitively, to accurately entrain to. S in this case must be seen as a duration that itself is traversed by interior projections of Q, and R (Q' and R'), and becomes the projective event that might be predicted to unfold at the new beginning S' (Stover 2009, 183). Stover calls this restatement a model of *nested projection* and takes it to be a fundamental concept in establishing the teleology of cyclic progression in timeline music.

What this restatement effectively goes - to begin - to address is the Asafo musicians' strong dependance on inter-instrumental timing and Ndoboa "leaning" on each other for a proper ensemble groove process to be established. It theoretically poses the explanatory model for musical processes, wherein inter-instrumental relations are experienced as the most prominent aspect of determining musical timing relations, relative to notions of metric isochrounous categorical constructs (4/4 or 6/8 meters) being the primary affective relation that inform musicians of right actual phrasing of rhythmic prototypes. This doesn't mean that the notion of metric pulses and structural downbeats don't have a place in a theorising about timing in Asafo groove performance, but it questions whether rhythmic-metric consideration should receive timing analytical primacy compared to the groove dynamics introduced by the pairing of instrumental patterns into resultant melodic-rhythmic constructs, which is more widely referred to by traditional west african musicians when teaching and evaluating proper actualisation of individual prototypical instrumental patterns in a groove context. What this processual thinking of "nested projective durations measuring out several subsequently unfolding larger durational rhythmic construct" allows for - by also fundamentally establishing *meter as rhythm* - is basically to explain how inter-instrumental relations of short and longer durational pattern onsets work to measure out each other in the process of musical unfolding, leaving them both to become mensurable in relation to each other's onset duration, and continue to cultivate this relationship (and many other held with other patterns interjected by the instrumentalists, dances or participating audiences) on a cycle iteration to cycle iteration basis.

To summarise, Hasty establishes a model of music as process, meter as rhythm (metric projection) based on the notion of projection and insider expectation which fundamentally can be said to drive cyclic musical process. Furthermore, Stover suggests that larger projections do not work to exclude the

possibility of multiple nested projections from being available for any listener to attend to, and make projective potential for future musical unfolding. Meanwhile, this leaves us with the question of "What is the nature of that (the events) which is being projected in timeline musics?". In other words, what is the nature of the teleology driving the process of cyclic progression in timeline music, as no cyclic music is static and non-progressing, but ever evolving yet always somewhat multi stable.

Dialogic Nature of Call-and-Response

After restating Hasty's projective model to allow for nested projections, we need to define the exact nature of the affective forces working to constitute events as parts of a context, given that simple note durations don't account for all of the thinkable elements that can be said to make up music as a; "totality of discrete elements joined through a system of relations or transformations." (Hasty 1997).

To begin to describe such specific forces, one might start by consulting the various possible ways of listening to musical process. Kramer suggests there being (at least) two co-existing categories of time-reckoning, or suggestions for listening, relevant to any musical analysis. The first being that of a linear time and nonlinear time reckoning - or a "becoming" and "being" interpretation of any musical analytical approach. Kramer's suggestion is not intended as rigorous theoretical formulations, but work well in outlining two complimentary forces in all music, asserting: "[…] time is first and foremost a relationship between people and event they perceive. It is an ordering principle of experience."(Kramer 1988, 5)

To his theoretical model of timeline musics, Stover introduces a synthesised version of a previously very common analytical model of call-and-response (by amonst others; Jones 1954, Chernoff 1979, Arom 1991, Agawu 2003). He firstly invokes the widely recognised concept of call-and-response, mentioned as one of the first characteristics in all introductory courses on West African musical practice, and continues to widen its implications to fit multiple aspects of a projective analytical model of creative musical processes of timeline musics .

In an analytical model taking on the notion of call-response dialogical forces present in most African and Afro-diasporic musics: A nonlinear listening to Asafo might reveal the call-and-response relations had between various cyclic patterns of ensemble groove - each having their specific simultaneously cyclic unfolding call-and-response relationship, with very little immediate change during performance. Then there is the linear listening which reveals implications of something happening, that is based on something that happened earlier. A very pervasive example of such a projective call-and-response dialogic unfolding on a linear plane, is the previously mentioned lead Asafo master drummer and supporting master drummer's speech drum exchange (see **Trascr. 8** in online appendix - for the full dialog exchange in the

Asafo performance). Master drummer literally calling “Bora So” and supporting master drummer responding “Domenadze Boko”, making up a call-response pair.

The tricky thing about call-and-response is that it very well outlines some cyclic motion, but doesn't invoke any framework informing a teleology of cyclic progression in music, as cyclic motion in itself might seem to connote stasis to some degree, while cyclic music as process is not static, it is in motion, in process, given its temporally bound nature, and thus this concept needs a restatement.

The slightest of issue is taken with the nature of the directed motion inherent in a call, as it points towards the response, which in turn has a semantically different kind of dynamism than the kinetic energy of the call, namely one of resolution-obligation. Stover thus goes on to restate the simple call-and-response dialogic function as a new expanded three part construct: As the call projects onto the response, the response projects onto the next call, and the call-and-response as a unit project onto the next call/response pair, these pairs within pairs unfold as a web of projections through time, easily imagined in the current context given timeline music is so fundamentally regularly cyclic as it is. This call-response dialogic framework is said to inform any important relation (to an insider), between a multiplicity of elements on all levels and at all times during a performance composition, but as to what specifically constitutes a call, and what gets to qualify as a suitable response is something which is specific to the expectations of musical insiders.

The Asafo performance makes a great case for exemplifying the value of this call-and-response dialogic analytical model through both a linear and nonlinear listening: Through a non-linear listening, an insider would be able to point out several call-and-response relationships acted out simultaneously between cyclic ensemble groove patterns like that of the Agye and Adem bells and Ansarba and Ampah drums. Secondly comes a linear listening which reveals the nested and concatenated call-and-response exchanges being had by master drummers over long spans of time, and which sometimes varies between relations expressed by speech drum syntax (special to the specific occasion), or as master drummers explores their structurally manipulated stocks of generative prototypical rhythmic material. In this linear listening, call-and-responses are constantly asserting and reasserting their position within a dialogic construct, as one call points to a response, which becomes the consequence informing the next call in some important way, and so on.

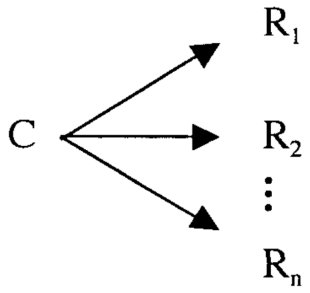
Master drummers might even alter their conversation to explore the non-linear time space, as two parts of one speech drum sentence are played out within the same span of time, as in the example of the speech drum exchange between the lead master drummer (Opusu drum) and supporting master drummer (Agyeyedo drum).

Expectations

To the point about insider expectations, Stover reminds us that in any music, the potential future inherent in a Hasty’ian projection, is a contingent future, with a large but finite range of possible continuations:

“This contingent future is based on our expectations that are themselves based on the breadth and depth of our familiarity with experiential situation, on our degree of insider-ness, and on the extent to which we have previously explored, refined, and weeded out our noetic options.“ (Stover 2009, 194)
Stover quotes Hasty, writing: “The anticipation of an immediately future event "is not the projection of a definite outcome but a readiness to interpret emerging novelty in light of what has gone on before”” (Hasty 1997, 77 qouted in, Stover 2009, 194).

Effectively, what is exactly projected could be a dynamic level, or timbre, or a particular drum stroke, or an ornament or simply an attitude. It could be a specific rhythmic figure, as in a call that is invoked by a previous response, and in this case this latter response might be transformed into a call by being responded to in a subsequent rhythmic utterance (Stover 2009). This could result in an overlapping call-response/call-response etc. progression in which each individual element is both call and response conterminously. This prompts him to redraw the previous call-response model, to show how a musician in the middle of the temporal flux of cyclic progression, is presented with a contingent future containing a diverse, but limited, field of possible responses to a given call that is presented to him (**Fig. 6**). The field is limited by not only the specific musical types, to which he is an insider, but also to the immediate past that has led up to the present which he now inhabits. This could be the nature of what has come before the call he is now supposed to respond to, or to the parts of a performance that is now in the midst of playing.



[Fig. 6 - Projected range of responses (Stover 2009, 196)]

Stover furthermore supplements this concept with that of Zuckerkandl’s wave analogy, away from-back to. His reason is that this is suggestive in the way it “invites the possibility that popular labels given to phrase pairs, labels like question-answer, antecedent-consequent, and call-response insufficiently describe the nature of the second term, because in addition to fulfilling some degree of resolution-obligation posed by the first term, it also projects a *new* such obligation onto the next first term, and in doing so sets the dialectic spinning-out of dramatic flux in motion.”(Stover 2009, 166)

Both concepts are similar but each introduces a different nuance of the same dynamism, as call and response are not necessarily so suggestive in their temporal character compared to that of the wave analogy. Both are, meanwhile, useful as part of an analysis. Call-and-response dialogic is valuable in describing rhythms which are both constituted together and simultaneously (like Agye and Adem patterns

which are co-constituting and fit together in an important way, but unfold simultaneously), where the wave analogy does a better job describing the ebb and flow of especially creative improvisatory musical unfolding.

This move finalises a music analytical model build from an epistemological vantage point viewing music as process. The analytical model is based on the notion that all performance composition is constructed on a multi-dimensional dialogic framework of call-and-response or an away from-back to dynamic. This makes up a multi stable and ungrounded construct of mutually constituting musical elements simultaneously becoming engendered and temporally mensurable by the range of affective relationships which make up the groove context. Central to the dynamic of this multi level (ungrounded) compositional construct and linear improvisatory unfolding, is that each individual musical utterance becomes part of an ever flowing string of nested projections and transformations following a trajectory build on the dialogic nature inherent to call-and-response and "away-from-back-to" analog going into informing a teleology of musical cyclic progression in timeline music.

Stress and Tonal Language - Accent and Melody

In order to understand the exact relations between patterns in a rhythmic relationship, one needs to go into a bit more depth with what actually constitutes a pattern's rhythmic identity. This returns us to the subject of speech drum, speech drum melody and how this impacts the concept of groove composition. As earlier mentioned, most West African languages, like Fante or Twi of the Akan people, are tonal languages, where conversely European are stress languages;

> "which means that the pitch of a syllable is a distinctive feature; the same syllable spoken on different pitches can change the meaning of the word containing it…stress may have an expressive role, but is unrelated to phonology, I.e., does not distinguish the meaning of words." (Arom 1991, 200-201)

Stress and accents are used interchangeably in a European language context, and covers the wide variety of relative emphasis or prominence given to certain syllables in a word. Stress in language might be caused by phenomenal event classes like; vowel length and loudness or relative pitch changes (in comparison to African languages, which have distinct pitch qualities/tones for specific syllables in a spoken word and pitch changes are secondary and decided by the syllabic "melody" required for proper pronunciation in a phrase).

It might be suggested that the phonetic importance of stress patterns in European languages and that of tonality in central African languages, might carry over and influence the way an insider individual experiences rhythmic structures and thus perhaps also which events that might come to influence grouping and establishing cycle beginning from a timeline pattern (downbeat).

Following this train of thought, it is tempting to suggest that the tonal qualities important to West and Central African language phonology, might carry over to drum rhythms (through the mnemonic coding offered by speech drumming mode logos) and influence the way accents are inferred onto specific rhythms, as traditional rhythms, in some important way (to the Fante), emanate from spoken language constructs.

This being said, tonal or stress language doesn't mutually exclude the application of stress' and/or tonality as phonetic qualities in their individual linguistic realms. The distinction is made because in each case, either tonal or stress patterns are more important in the phonetic distinction of spoken words.

From Tonal Language, Speech Mode Drumming to Melo-rhythm and Rhythm Phrasing

As already mentioned, rhythms of West African percussion ensembles are by the master drummer construed as - more or less – language-like structures, in accordance with the common held belief that rhythms - in some important way - emanate from (or is related to) speech drumming, and thus fundamentally spoken language.

To a master drummer, rhythms, before becoming related to ensemble structures, are taught and conceived as separate whole-sentence constructs with their own unique beginning points (in respect to its construct as a speech drum sentence), which is not necessarily synchronous with a cycle beginning point. Thus, when entering into an ensemble texture, all rhythms are started from their unique beginning points (what Chernoff after A. M. Jones (1954, 317) calls ""staggered" independent entrance into the cross-rhythmic relationships of the music"), and only later become absorbed into the ensemble cycle texture (see evt. again **Transcr. 2** in online appendix showing an overview of all Asafo ensemble patterns transcribed relative to their unique beginning points).

The reason for always launching into one rhythm from its unique beginning point, when entering into ensemble playing, could possibly be connected to the mnemonic notion that rhythms are more easily understood and remembered if they are learned as intelligible speech drum sentences, before becoming known as an element within an ensemble texture:

01:25;00

Takyi: "I think that it is, like you write your music… so this is our written music… if you know this [the rhythm as a speech drum sentence], you always have it here [pointing to his head]."

Interviewer: "so you can play it?"

Interviewer: "So if you are in any doubt, you can always refer to the…"

Takyi: "refer to the phrase"

[cit. interview (part of interview transcribed and available in the online appendix)]

The tonal language features in talking drum rhythms, serve to explain a very common analogy expressed by Takyi's mixing of terminology, as he describes how his mode of listening and determining proper rhythmic and groove timing; namely that of *phrasing* and *melody*. One instance where Takyi often substitutes the term rhythm with the term *melody*, is during our conversation about determining if ensemble players sound clear together or not. He substitutes the term rhythm with that of melody and substitutes the notion of right timing with that of right phrasing. This notion of "right" phrasing is used when talking about his own pattern (wherein right phrasing is always dependent on the other instrument's way of playing), but extends into the topic of whole composite ensemble texture. On this level, he speaks of a right resultant melody being an indicator of the ensemble sounding clearly together.

This analogical relationship of rhythms as melodies and correct timing as correct phrasing, is exemplified very well when I ask Takyi about how he would practice the Agye bell timeline pattern alone (which is uncommon but not impossible). To this question he instantly invokes the Adem (intermingled) bell pattern as an indispensable element for him to be able to practice the upholding of a proper rhythm phrasing of his own pattern. He highlights how he hears his own rhythm as a melody, going into a resultant melody together with the Adem bell, very much akin to the time-reckoning *being* (relative to becoming) informing a non-linear listening strategy suggested by Kramer earlier in this thesis (1988). This resultant rhythm, as a melody in its own right, has to sound properly, before one is able to determine if they are phrasing correctly:

Takyi: "I always say, take it [the rhythm] as a melody… if you take it as a melody, the two separate [melodies]… the resultant melody of them… if you take that then it will stay here [pointing to his head/mind]"

The importance of this particular mode of listening is underscored several times during our lessons, where he exemplifies how he would sing the Adem rhythm inside his head to be able to practice the Agye by himself. The strength of such a referential tie is supported by Chernoff as he writes: "Most significantly, then, once you are playing the music properly, it becomes extremely difficult to play your part unless the whole ensemble is playing; you depend on the other rhythms for your time" (1979, 55).

Furthermore, when the whole orchestra plays together, it presents Takyi as a lead master drummer, with a certain resultant [composite] melody that he uses to determine if the groove is right or, in other words, if the ensemble sounds *clearly together*.

02:18:30

> **Takyi:** "When we play together, all these layers, they become one long sentence… like for instance the Esor, if you want me to sing it… [he sings firstly the Agye timeline, and then changes over to the resultant melody he hears within the whole ensemble texture - listen to Sound Example 4 in online appendix]…"
>
> **Researcher:** "So that is what you hear in your mind?"
>
> **Takyi:** "Yes"
>
> **Researcher:** "When it sounds right…?"
>
> **Takyi:** "Yes when it sounds right… but if it doesn't sound [like that, then] aaaagh, somethings not quite good"

(cit. interview, outtake transcription in online appendix)

Takyi adds that this particular resultant ensemble melody is a bit different to each leading master drummer, as he might "pick" (choosing to recognise as musically important) different onsets from the different patterns to go into his particular resultant ensemble groove melody.

Meki Nzewi is very sympathetic to Takyi's substitution of rhythmic patterns with that of melody and phrasing, as he suggest the novel concept *melo-rhythm* to African musicology, which I have earlier been referring to as "melodic-rhythmic patterns". Melo-rhythm being a term referring to; "a rhythm organisation that is melodically conceived and melodically born".

Nzewi, supports Takyi's notion, when he points out that; "[…] in actual performance there is scarcely any drum that takes on the role of an isolated percussive-rhythm function in the musical ensemble." (Nzewi 1974, 23)

> “The audio effect might purely be a percussive-rhythm function, but the audio mental perception which is really the operative essential for in-culture appreciation, would recognise the clapper music [being Nzewi’s example of the must purely percussive instrument imaginable, red] as possessing a rudimentary melo-rhythmic essence.” (Nzewi 1974, 24)

Nzewi’s concept of melo-rhythm, in some way supports the earlier suggestion made in this thesis, that rhythms might in some important way be construed as sharing the tonal qualities of language, given that the speech drum practice fundamentally works by uttering the phonetically important tonal features of speech, using the pitches of a drum head. Master drummer then uses these speech constructs as a fundamental source of creative rhythmic expression and composition, and these tonal language features might in some way be suggested to carry over into the realm of musical performance.
While not all participants know the rhythms as specific speech drum sentences, they might know the tonal structure of such sentence, and use this melody as a mnemonic tool for remembering the right timing of their rhythm’s onsets (or one might rather say “right phrasing”). This, again, could explain why musicians always enter into a given metric ensemble texture from their respective unique beginning point and not from the cyclic Referential Time Point (RTP), as this would sever the mnemonic coding made between melody and onset timing through phrasing.

Such suggestion is strengthened as Takyi often and without hesitation invokes the notion of rhythms as phrases with melody, and that right ensemble timing can be evaluated by listening for a certain recognisable resultant melody (what Nzewi calls motive), and evaluate if it is phrased right or at least consistent. Nzewi, like Arom, invokes the term tone colours. Arom reaches for this instead of tone as he wishes to separate pitch scale tonality from untuned pitch differences.
Nzewi, furthermore, outlines a variety of stroke techniques both on bell’s and drums which can be used to cause significant pitch variation or tonal shading on the instruments, forming an “apparent and non-apparent system of pitches which make a rhythmic organisation a cultural melodic essence”. Nzewi, in similar terms to Takyi, insist that; “[w]ithout the application of all these tonal nuances, a folk drummer would be completely lost. Experienced folk drummers are "listening" performers, more so because their rhythmic out-puts are the direct result of melodic conceptions which result in melo-rhythmic components of the overall texture of a performance. If a folk drummer is asked to reproduce his part in a performance, he does not clap or tap it - he sings it, using non-textual syllables."(Nzewi 1974, 26).

Whether the pattern's mnemonic construct is purely melodic or also includes internally referencing to it as a speech drum sentence, it is very dependent on the instrumentalist's schooling, and both might be the case for e.g. master drummers, while some ensemble musicians and audiences might only know a pattern as its melo-rhythmic construct.

To the point made by Takyi, about listening to the ensemble texture as one resultant melody, Nzewi suggests a different, but similarly conceived term; the *melo-harmonic ethos*. This Melo-harmonic construct is what is being evaluated by the master drummer (if not all participants) and the ethos refers to there being a collective agreed upon musical (melo-harmonic) ideal, which is stable and predictable by all participants showing responsiveness for each other and leaves room for creative variation.
While Takyi doesn't relate to it as a harmonic concept, this might have to do with several factor specific to our conversation. First of all when he sings his resultant melody for me, it is hard to know if he psycho-acoustically actually hear the Asafo (Esor) melo-harmonic ethos construct internally as he sings his resultant melody. Furthermore, the whole dialog we have had until this point has been concerning rhythms, which is limiting the vocabulary, as it strictly locks our perspective to the aspect of percussion playing having to do with timing and cycle and seldom something which has to do with pitch qualities, as this concept is often reserved for dialog about tuned instruments only. But as we begin to speak about how he distinguish if the ensemble sounds right together (meaning making an aesthetic evaluation of the whole ensemble sounding together), this is where he take the discursive freedom and introduces the concept of rhythm as melody, the strategies for learning right phrasing (like always practice ones rhythm with another rhythm of the ensemble texture - either sung or played by another instrumentalist).

Nzewi writes: "The analytical perspective that considers textural components as melo-rhythmic elements should then see the overall rhythmic complexity of an orchestra as possessing linear and vertical interdependent melo-rhythmic unity. The overall effect of the melo-rhythmic interdependencies produces the cultural instrumental melo-harmonic ethos. This melo-harmonic ethos is responsible for the meticulous considerations given by performers to the tone colours and tonal possibilities of their instruments."(Nzewi 1974, 27)

Chapter 3: Composing Asafo and Timing Relations

Interrogating Timeline

Having explicated some general concepts which make intelligible the affective relationships which engenders individual patterns rhythmical relations, this leaves us with one last question, to do with exact nature of central governing concept of timelines as a metric-like construct.

To get closer to this we might return to the Asafo performance's Agye timeline pattern as "commonplaces rich in associative meaning for cultural insiders", and "short, distinct, and often memorable rhythmic figure(s) of modest duration ... [that serve as] point(s) of temporal reference." (Agawu 2003).

I will in the following section be occupied with interrogating the Agye timeline for its; "[…] powerful generative character and the degree to which they [timelines in general, red] influence the metric, rhythmic, and phrasing nature of a performance" (Stover 2009, 91 - my interjections)

This includes becoming familiar with the specific listening taken on by Takyi, as he makes associative relations between points in the timeline cycle and that of a metric cycle constituting the collective temporality. Furthermore, we will advance into a much more multidimensional model of ensemble performance, as we take the last step and establish all of these musical elements as a multi-stable (ungrounded) construct unfolding within the flexible metric space of beat span.

Timeline Pattern

As pointed out earlier by London, unlike Lerdahl and Jackendoff, one can't assume any specific universally a prior generative relationship between certain basic purely phenomenal event classes of musical surface material and that of metric downbeats. Meanwhile, even the rather relativized and idiomatic relationship he suggests, between meter and surface musical material, effectively affords any theorist very little epistemological wiggle room for dealing with a wide variety of structurally and micro rhythmically non-conforming musics, as he places sounding structures in a subverting relation to any listeners supposedly nominal cognitive isochronous meter construct. What he offers for understanding and dealing analytically with more fluid or irregular timing patterns and relations (seen from the point of view of the Western technological sciences) are as features of beat level syncopation and micro rhythmic expressive variation from meter as a subverting structurally defining norm of an isochronous metric hierarchy.

This stance leads London to speculate if timeline based West African traditional performance practices should be placed in a category of non-isochronous metered (NI-metered) musics. In such a category, one also finds many Balkan musical traditions constructing meter from an additive metric principle. One metric cycle is thus constituted by two or more asymmetrical beat groupings, each beginning with one beat that is phenomenally accented and often emphasised on the music's surface level, spelling out a metrical structure like that of the "chrooked dance" (gankino horo) of the Bulgarian folk tradition <434>; or the metric structure in Leonard Bernstein's "America" <33222> (Stover 2009, 74)

To this metrical organisation, London proposes a novel set of wellformedness constraints (again after Lerdahl and Jackendoff's wellformedness rules), invoking determining principles of "near-symmetry" and "maximal evenness" to govern any timeline that takes on the position of NI metric reference structure. In

doing so, London falls into an old trap, confusing "[…] metric structure with syncopation, underlying structural frameworks with surface-level activity, and the roles that various musical parameters play in metric determination" (Stover 2009, 70).

London's confusion is understandable in that one as an outsider-analyst would not want to relegate something as obviously structure-deterministic as a timeline pattern to the level of syncopated surface activity. London's approach is not made any less sensible to outsiders as most musicians (including many of the participants in the Asafo performance), don't count off the beginning of a performance, don't stomp their feet or nod their head while playing their instruments, leaving many metronomically trained musicians to conclude that there can be no isochronous beat pulse structure involved in the process of entraining "correctly" to this music.

This misconception, meanwhile, is contested by Agawu, who insists on bringing timelines into their much larger performance contexts, including that inhabited by dancers and audiences. He sees this interpretation of timelines as asymmetrical (non-isochronous) metric beat structure, as incongruous with the nature of the music and denying its dance-rooted orientation of performance practice:

> "[…] the key to understanding the structure of a given *topos* is the dance or choreography upon which it is based... No one hears a *topos* without also hearing - in actuality or imaginatively - the movement of feet. And the movement of feet in turn registers directly or indirectly the metrical structure of the dance. Conceptually, then, the music and dance of a given *topos* exist at the same level; the music is not prior to the dance, nor is the dance prior to the music." (Agawu 2003, 73)

This also goes for Asafo performance, as Takyi definitely identifies a downbeat pulse strata being present, in its non-sounding form, and occupying a significant role as a rhythm expressed by the feet of the dancers. In the recording made for this thesis, even the bell players sometimes synchronise their steps back and forth during the performance, which according to them was considered dancing.

Timeline as a Meter-like Construct - a Non-Hierarchical Model of Metric Cycle and Pulsation

Instead of invoking the recursive construct of psychological meter and accentual hierarchy, Arom (1991) offers a substitute in the form of the relatively neutral term *pulsation*. Pulsation describes a regular, grounding beat that doesn't invoke any notion of regular cyclic periodicity of accentual hierarchy, like that which is baked into the meter construct. It is a series of isochronous, neutral, constant, intrinsic, referential units. Where Arom's term pulsation refers to downbeat pulsation known from the beat level in

hierarchiesed meter, Stover suggests using pulsation as a term for the smallest metric isochronous events expressed by the musical surface, this is termed *N-cycle* by London and *density referent* by Mantel Hood (Hood 1982, 114, London 2012, 72-74).

This effectively means that any metric cycle is defined by the smallest integer unit expressed by the musical surface, and is organised in e.g. 6- or 8-pulse cycle strata or 12- and 16-pulse cycle strata. Furthermore, this leaves cyclic downbeats to be expressed as groupings of triple or duple nature which traverses this bigger field of integer pulsations. A four count downbeat cycle in a 16-pulse cycle, in turn, would be called a four cycle traversal of a 16 pulse cycle, and a six beat downbeat cycle of a 12-pulse cycle in turn becomes a two cycle traversal of a 12-pulse cycle. This, meanwhile, doesn't imply any notion of metric accentual hierarchy (beat level + subdivisional structure), but is utilised as an analytical and pedagogical mean, in order to clearly describe and illustrate both metric and rhythmic structures within the same substrate, and not ascribe any primacy to any of the two. The notion of n-cycle will, in turn, be replaced by the novel concept of beat span, suggested by Stover, for understanding the flexible nature of micro timing.

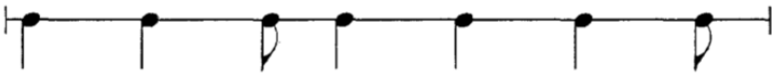
Meanwhile, as pulsation doesn't carry any a prior downbeat cycle by itself, we need to consult its relation to timeline pattern (or topoi), already defined by Agawu as “commonplaces rich in associative meaning for cultural insiders”, and "short, distinct, and often memorable rhythmic figure(s) of modest duration ... [that serve as] point(s) of temporal reference.”. Also, I need to stress that I purposefully conflate the notions of metric and cyclic in this context, as they are fundamentally the same and are given together with topoi. Furthermore, the establishing of a downbeat cycle involves firstly establishing a cyclic beginning point in the timeline pattern and afterwards engage with this multi stable cyclic construct from the point of view of the dancers, to experience which downbeat traversals are suggested by the movement of feet (like what is suggested by Agawu 2003).

Timeline Governing Metric Cycle

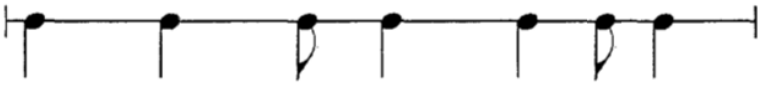
In the same way the timbre of bass drum has been yoked to the position of metric beginning point and thus downbeat structure, certain features of the Agye timeline in Asafo are recognised as important for identifying the cycle beginning point/downbeat for insiders. Once again, such feature might be a silence (like in the case of highlife music, which Agawu uses to illustrate this specific point), a distinct structural important point in a pattern, a dynamic intensification (loudness) or tone colour. Nothing is known before consulting the ear of a musical insider. Meanwhile, the point in a timeline determining the metric beginning point might be the same across many musics, or might very significantly depend on the performance practice (and culture) in which it occupies an important position.

One very prominent example is that of the three different rotations of the *standard pattern* of West African music. As the standard pattern constitutes a seven onset non-isochronous pattern traversing a twelve-pulse metric cycle, it offers several different possible cyclic beginning points (to Anku, (2000), termed Referential Time Points). Anku outlines seven different rotations of the same standard pattern onset material but goes on to single out three rotations that are central to traditional performance practices of three different ethnic groups within Nigeria and Ghana. The Yoruba pattern <2122212> and Ewe pattern <2212221> (see **Transcr. 9,1 - 9,2 - 9.3**) and the Bemba pattern <2212212> commonplace to many Central (and West) African countries (2007, 13).

[Transcr. 9.1: Yoruba pattern]



[Transcr. 9.2: Ewe pattern]



[Transcr. 9.3: Bemba pattern]

Saying something general about what causes a specific point in a timeline pattern to become determining of the cyclic beginning (functional downbeat) is close to impossible, but commonalities might be gaged if one undertook a study of various timeline musics performed by the same ethnic group.

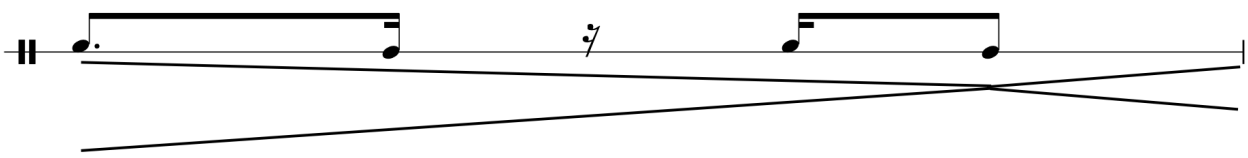
As mentioned in the earlier paragraph, one specific rhythmic timeline pattern might be part of several traditional musics in its different rotations, which possibly has been caused by several centuries of innovation, amalgamation and branching out of traditional practices, now being distinct in various particular ways to one ethnic group, until new influences are absorbed. Meanwhile, as suggested by the dialog about the two structurally similar but widely different thematic interpretations of Agye (timeline) patterns mentioned earlier, many West African master drummers might even consider the same pattern in its different rotation as dissimilar, as similarity depends on the nature of the intimate relations between the timeline and the rest of the rhythmic patterns, making up ensemble groove context and occasion. In other

words, the notion of several rotations of the pattern sharing some essence, on the basis of them having the same amount of onsets, might to a master drummer seem farfetched.

“Picking” of Metric Downbeat Pattern from Timeline Cycle

Specifically when teaching the Agye timeline, Takyi refers to the timeline pattern as a melodic phrase which starts on - what becomes - the second onset in the Aguy patterns original rotation, and goes towards a gravitational point on the last onset in the pattern, which in turn comes to indicate the metric cyclic beginning point or RTP.

For right phrasing, he says, the pattern should be heard/felt like a slow exhale towards the pattern ending (or sigh), and faster inhale as one arrives on the last onset and prepare for a repetition, and it is in this assistive relation between phrase breath cycle and cycle beginning point (downbeat) that Takyi makes the intelligible connection between the Agye timeline pattern as a melo-rhythmic phrase and a metric cycle (see Transcr. 10).



[Transcr. 10: Timeline with breath cycle]

Thus, what according to Takyi is driving the forward motion of cyclic progression, is the dynamic introduced by the teleological motion specific to a breath cycle. The breath cycle is inherent to the timeline pattern as it maps out the motion of the pattern melo-rhythmic construct, having its roots in its conception as a construct of speech mode drumming. This breath cycle dynamic of timeline (and maybe other levels of Asafo performance) fit very eloquently into the earlier mentioned wave analogy, which according to Stover’s theory, describes the dynamic of several linear listening aspects of composition in timeline music.

But breath cycle doesn’t just incite the moment of cyclic beginning point, but also infers a sort of emphasis on this particular place in the cycle, effectively elevating it into a status of prominence relative to other eventual downbeat positions possibly present in the metric cycle to the insider listener. It takes on its status as prominence and this emphasis also works in being suggestive of a defining relationship with a second downbeat, effectively prompted by the motional quality of “back to” suggested by the construct of the wave analogy. Affirming one’s suspicion of a particular beginning point as a point of downbeat prominence, one might follow Agawu’s suggestion and turn to consult the feet of the dancers (and bell

players), which can be seen clearly expressed from 07.00 min of the video recording of the performance (in the online appendix) which interchangeably moves "away from and back to" within the duration of the timeline cycles, dancing out the two beat downbeat strata traversing the field of the Esor Agye timeline bell cycle.

To Takyi, the dancer "picks" the downbeat pulse pattern from the timeline, which is a term very often used in this context. Two things are meant by picking: (1) instrumentalists either 'receive' a rhythm from the master drummer (or any other instrumentalist from which a pattern is "taken over") or (2) when an instrumentalist "extracts" an unsounded rhythm from a texture and begins adding it to the sounding surface. The term is even used when instrumentalists begin playing a relational rhythm to an already sounded one - establishing a sounded resulting melody - it is not added, cause it was already there "unsounded" latently in the sounding one - instead it is "picked". This concept of "picking" very much works to outline the nature of a *real object* as an identity of double status of *virtual* and *actual* as presented earlier. The Asafo musical texture - to the insider listener - contains not just what is sounded, but the potential presented by that which is there but is unsounded. It is the actualised relations of sounded patterns, relations between timelines and dancers feet and the various potential speech drum exchanges which fit within the theme of the performance occasion.

Takyi expresses this during one of our lessons as;

"the player knows the sound of all the music and also knows what is not there… so he can pick it and begin to fill out its space… he also knows how to vary because they also fit into the music but variation needs space from the other players so all don't change at once"

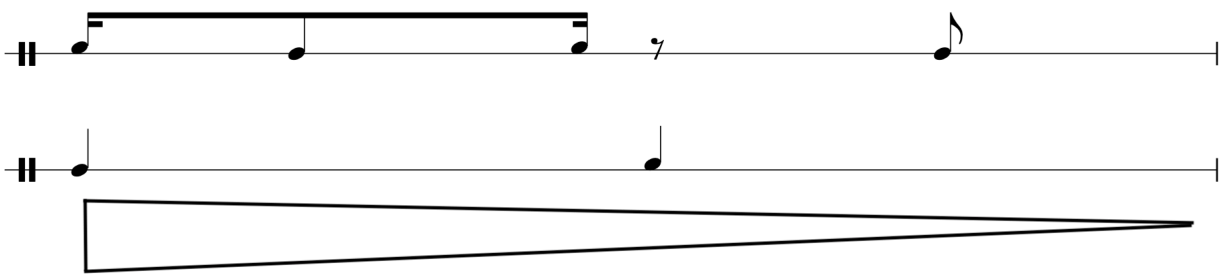
[cit. lesson conversations]

All is constantly present to the experiencer and some are "picked" and brought to the surface level, and when varied becomes not just varied in relation to the surrounding sounded instrumental patterns, but also in relation to its own prototypical unsounded identity which is latently still present in the affective relations in the groove texture. The potential rhythms to be picked are present in the ensemble texture as much as they are in the head of the player, because while it seems to be that players need the insider knowledge to hear them, it doesn't mean that the music is not continuously kept together by these relations, even when not recognised intelligibly - it is still what drives the music and forms it - thus not becoming eradicated just because it isn't expressed by a instrument. It is knowledge given and preserved by continuous exposure to performance, which might be innovated, but still keeps the fundamentals flexible inter-instrumental relational theoretical framework of groove production. Meanwhile, what is related might change gradually as new people take the position as instrumentalist and master drummers.

In short, musicians experience the music through its sounded surface and their non-sounded existing and potential compositional relationships. Within the texture of the music, there is not just the information sounded, but a full-body of affective relationship doing work, constituting each other individually and as a

totality. Furthermore, potential additions to the sounded texture, while not sounded, are not - to the insider experience - any less real than those which have been undertaken by sounding instruments, this might be the downbeat structures or specific rhythmic patterns inherent to the timeline pattern, and is instantly picked by dancers and audiences.

For displaying and understanding the rhythmic compositional dynamic caused by the rhythmic patterns interrelation, a syncopation wave is drawn onto a notation of rhythmically related structures, illustrating their moments of relative poly-rhythmic sycopation consonance and dissonance, or moving in and out of functional alinement with each other. In such context, the timeline could be understood as syncopating with (not against) the metric beat cycle (as rhythm) by the pattern onsets moving in and out of relative consonance with the downbeat cycle, choosing different traversals of the same cyclic terrain while relationally expressing a dynamic of interchanging consonance-dissonance, very much in line with Zuckerkandl's wave analogy earlier outlined (**Transcr. 11**).



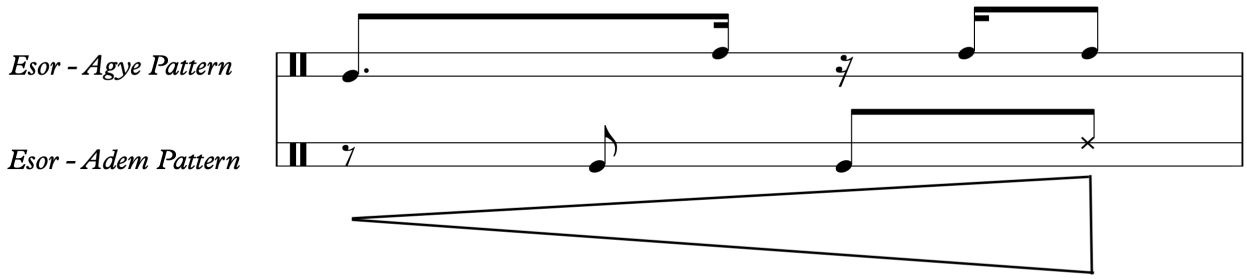
[Transcr. 11: Timeline + Metric cycle and syncopation wave]

It is the composing and maintaining of these sounded inter-pattern relationships that instrumentalists recognise as their primary framework for right groove production and the process of picking and building up a groove. On a pure rhythmic level (momentarily ignoring the melodic aspect of the melo-rhythmic construct suggested by Nzewi) the relationships are termed poly-rhythmic constructs by Arom, stating:

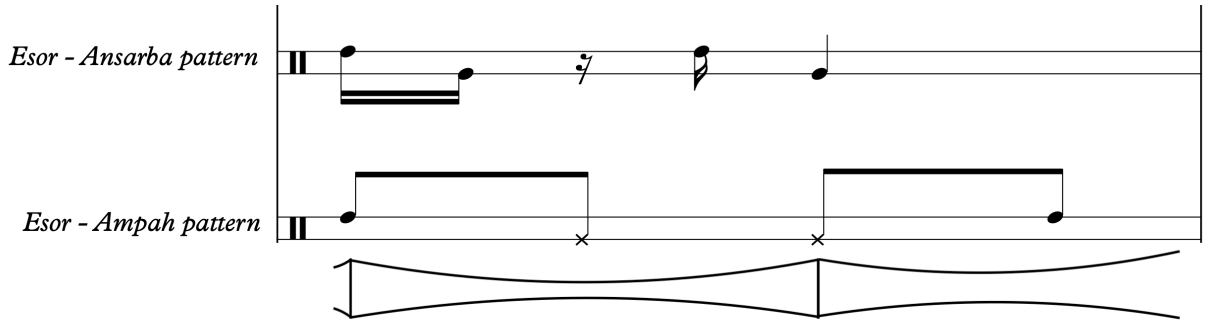
> "Thus, most music performed by intrinsically polyphonic instruments involves relations of a polyrhythmic type between the parts played by each of the performer's hands. It is moreover rare to find such an instrument being played without the support of at least one percussion instrument, in such a way that a polyrhythmic relationship exists between two. This suggest that if one can grasp the principles governing strict polyrhythmic one will ten find it easier to assimilate the ways in which the melodic instrumental and vocal types of polyphony are organised." (Arom 1991, 217)

These poly-rhythm pairs are outlined as presented earlier in this thesis, while now also having added to them a poly-rhythmic dissonance and consonance wave showing how they at various points in the cycle

come together in poly-rhythmic consonance only to departure into a line of non-coinciding onset for then to return to poly-rhythm consonance at a different moment (**Transcri. 12 and 13**).



[Fig. 12: Esor - Resultant Rhythm Agye and Adem - Poly-rhythmic Syncopation Wave]



[Fig. 13: Esor - Resultant Rhythm Ansarba and Ampah - Poly-rhythmic Syncopation Wave]

Firstly there is the Agye and Adem patterns which moves from a point of poly-rhythmic syncopation dissonance at the the beginning point of the ensemble groove cycle, into syncopation consonance as they meeting up at their last onset in the cycle end. A different syncopation wave is expressed by the Esor-part's Ansarba and Ampah pairs, wherein they meet up with their patterns at the beginning and middle point of the cycle, forming two soft syncopation waves from one moment of poly-rhythmic consonance to the next. While these to relational pairs are the most important for groove musicians inter-relational timing in the Esor part, many more syncopation waves are able to be constructed between other instrumental pairs, and these are just as readily available for listeners to attend to as the ones displayed above.

Beat Span

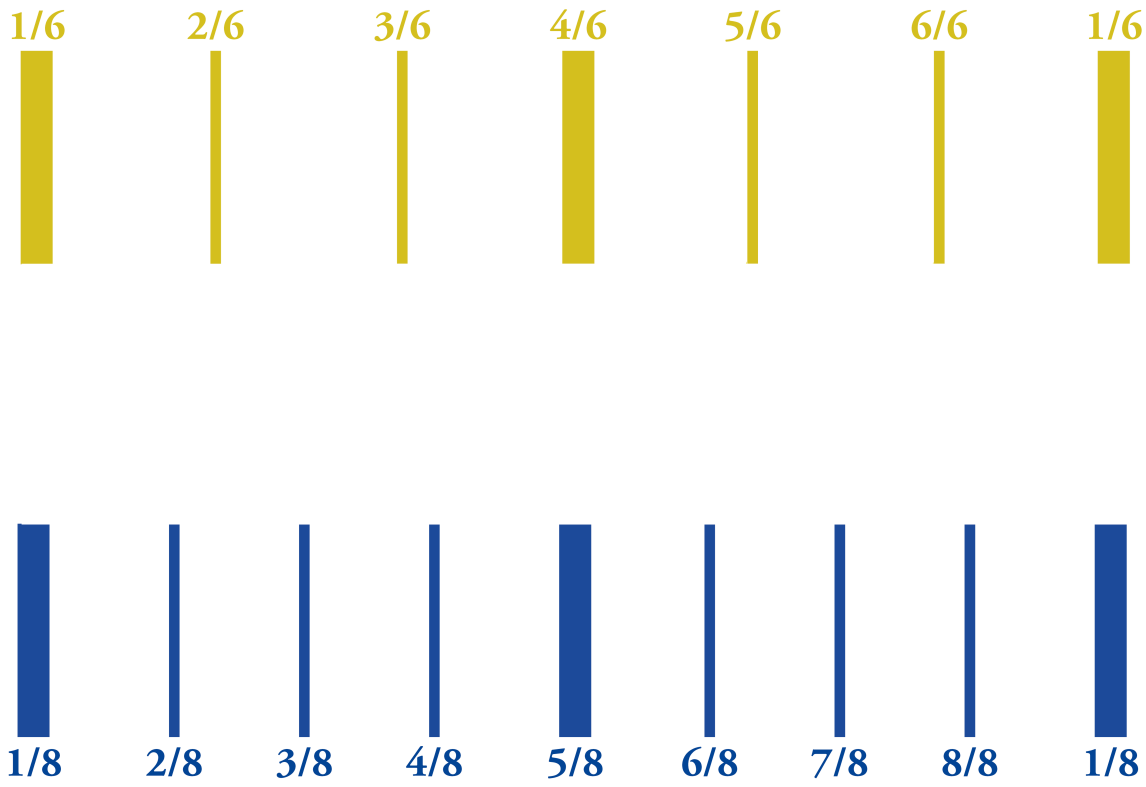
Ubiquitous to the entire listening experience of Asafo performance is the flexible quality of the ensemble groove's instrumental micro timing. The recording of the Asafo performance used for this project consists of two ensemble groove parts, Esor and Ase, and both are composed in seemingly different, yet complex and interesting ways respectively. Since I wish to go into considerable depth with several different timing

relations, but is limited by the space of this thesis, I will in the coming computational timing analysis be mostly occupied with the Esor part (or high part), as it offers the most compelling examples for talking about highly flexible ensemble instrumental timing and the outline of beat span, leaving much more to be analysed in several future studies.

The sensation from practicing the groove patterns together with Takyi leaves one with only a very faint sensation of a guiding pulse strata. What seems most pertinent to the listening experience of the whole performance and improvisatory play by master drummers, is one invoking two equally possible timing strata possible for patterns to be expressed along, that of a 6- or and 8-pulse cycle. As a small exercise, I took several rhythmic patterns and played them in both their triple and duple subdivisional phrasing on top of the whole Asafo texture, leaving me with the experience that both phrasings of these patterns, would "in principle" be equally viable metrically within this context - not necessarily to insider ears, but at least to my experimenting ears.

For addressing this ambiguous co-presences of two equally salient density referents in a performance like the Asafo, Stover suggests a novel concept of *Beat Span,* specific to timeline music and or maybe also many other musics which have multi-metric or flexible rhythmic phrasing as one of it stylistic traits - either as part of groove, or improvisatory practices. To make the concept of beat span intelligible, Stover (2009, forthcomming) offers a heuristic, which presents any metric cycle (like a timeline cycle) as a field traverse by two density referents of triple and duple nature respectively.

This might be that of a 6-pulse cycle and 8-pulse cycle strata, which in the example of the Agye timeline is traversed by two downbeat structures, and is realised in the moments of the cycle where pulses on the different strata intersect - that being the beginning and middle, in the 6- and 8-pulse cycle (see **Fig. 7** presented beneath, thick lines = Downbeats). In many timeline musics, instrumentalist might - depending on the practice - choose to phrase several patterns within groove, along widely different metric pulse strata at once, and this is without confusing either fellow musicians, dancers or audiences. It is often even - like in Asafo - a rhythmic sensation which is genre specific, and expected of good musicians playing in some Afro and Afro-diasporic musics.



[Fig. 7: Two pulse cycles with marked downbeat]

Stover, like myself, in his ontological ungrounded and processual music theoretical approach, emphatically resists the determination made by gestalt theory, that such superimpositions can't exist, and he even goes on to insist that effectively every experience arises from a constant processual superimposition of *virtual* and *actual* affective forces (fluid and non essential identities engendering identities, in a constant process of identity formation, ethical in nature) creating *real objects:*

> "Beat span is, in part, a product of (at least) two opposing gravitational forces: the 12-cycle and 16-cycle [in the present example of Asafo's Esor part, these are 6-cycle and 8-cycle] each influencing how actual played gestures locate temporally in relation to one another. The cycles are virtual agents, there acting on the music, but not (necessarily) present as first-order phenomena." (Stover forthcomming - intertjektions mine)

Several authors, researchers and practitioners speak of this seemingly superimposed poly-metric pulse grid being present to musicians and in many musical practices. To David Peñalosa, in respect to the timing tendencies asserted within Cuban timeline musics, this construct is described as "a regular superimposition of cross-beats over main beats", wherein cross-beats in this case refer to the cycle

dividing beat level pulsations into cycles of double pulses and main beats dividing into triple pulses - outlining a 6- and 8-pulse cycle strata when superimposed (Penalosa and Greenwood 2009, 21).

This field is by Eugene Novotney termed the "3/2 cross rhythm", which he asserts to be determining to the West African rhythmic structure, and also Nketia highlights this superimposition of strata as a important concept for understanding West African traditional music:

> "This interplay arises where rhythms based on different schemes of pulse structures are juxtaposed. The simplest type of cross rhythm is that based on the ratio of two against three, or their multiples - that is, vertical interplay of duple and triple rhythms (as opposed to hemiola, where the interplay is linear)" (Nketia 1974, 134-135)

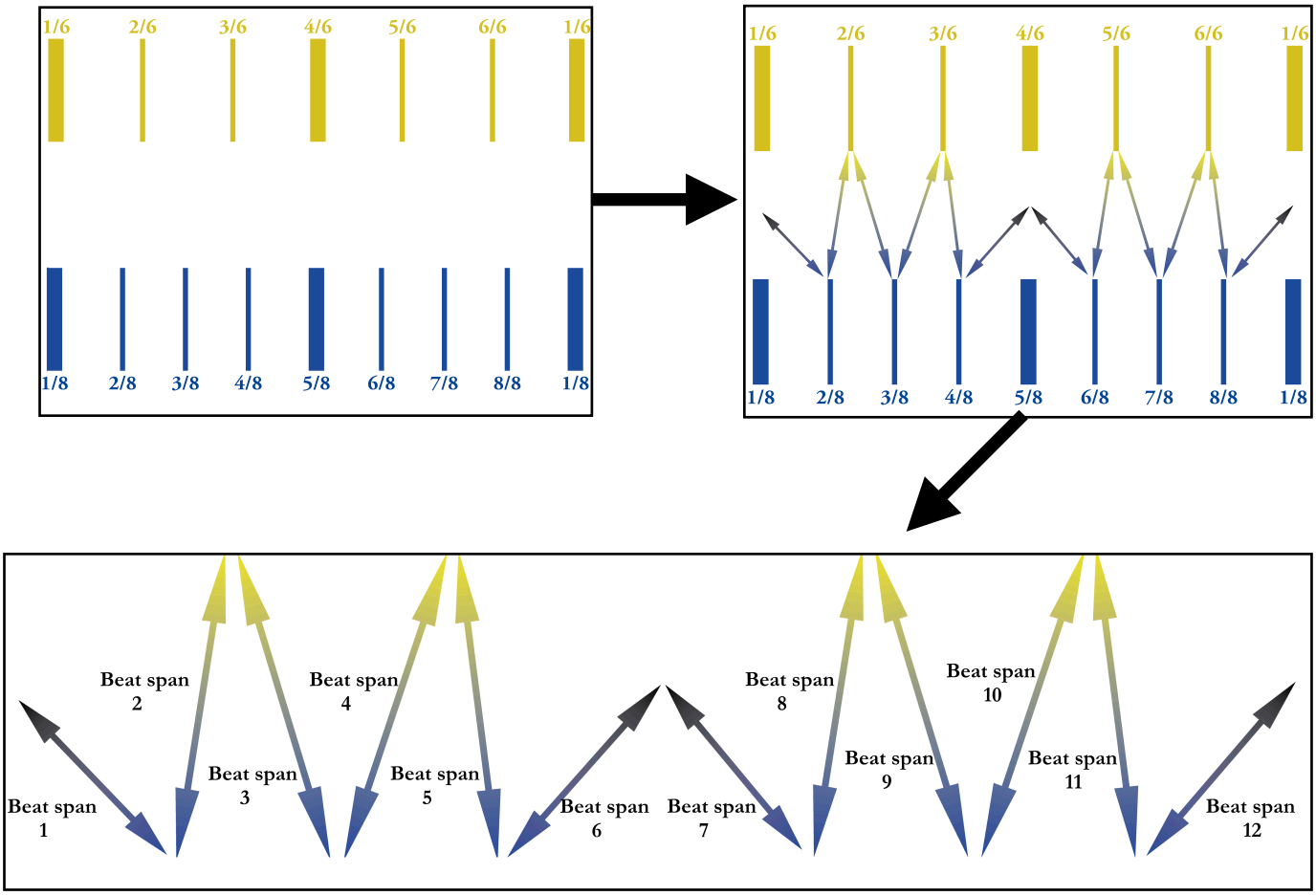
Stover goes on to unpack the implications caused by this seemingly pertinent presence of two possible strata for rhythmically alining patterns within the same cycle strata in Afro and Afro-diasporic musics, as he explains how these two supposedly superimposed cycle strata should be understood as interacting affective forces in a very real sense in timeline musics. In-between them, he explains, they outstretch so called liminal beat span spaces which are affected by both pulse cycles working as their outer parameters exerting a subtle gravitational pull of the space. Beat spans effectively work to engender musical patterns, which are actualised within them, as liminal expressive actualisations of prototypical genre specific musical utterances.

Flipping the Script: From co-present Metric Strata to Metric Liminal Space

Important for the understanding of this concept is that the 6-cycle and 8-cycle are forces rather than concrete material entities, doing work whether or not overtly articulated by performed patterns, and that they might only be perceivable through the effects they have on played utterances. Thus, beat spans are not idealised models of which expressive variations are physical manifestations, nor are they basic prototypes from which those expression deviate.

> "*The performative spacetime of timeline music occurs within and along beat spans, which are temporally extended constellations of near-simultaneities, the precise details of which are enacted relationally in any given context.* If anything, the isochronous cycles themselves are constructed after the fact, as heuristics, as products of pedagogical scaffolding." (Stover forthcomming, italic in original)

Stover here effectively goes on to flip the script on this superimposition model, as he, as well as I, work from a non-grounded music analytical footing, turning this conception of a structure outlining liminal spaces (thought of as stretched out between two metric cycles) into durational beats constituting flexible temporal spaces or time 'spans' (**Fig. 8**).



[Fig. 8: Flipping the model of beat span from superimposed state to beat span spaces of near-simultaneity]

Stover uses the concept of Husserl'ian *now-horizon* to explain the nature of beat spans' "durational" quality, and thus why micro rhythmic clashes can exist in apparent cognitive consonance, as he enters a discursive terrain in which he can speak of near-simultaneities as actually being temporally corresponding.

To Husserl'ian thinking, the phenomenology of present is not to be thought of as a definite moment in time becoming substituted by a new moment akin to in a film role frame-like fashion. Instead, present is much better thought of as a continuum which contains interpenetrating remembered pasts (pretensions) → presents, which go on to animate the experiences anticipated in an immediate future - also termed *protensions*. This past→present directional energy is a rich and complex network of pretensions, which

allow us to develop a rich and diverse horizon of potentially imminent events (limited selection of possible future presents), based on our accumulated, emergent knowledge of the identities of the various directed motions that preceded: "*now* is not a tiny point in time but a broader envelope of time that is at once approaching and receding, and, most important, I am apprehending that span of time *all at once*. *Now* lasts perhaps a few seconds, and includes both a very recent past and an immediately imminent future." (Stover forthcomming, italics in original)

Present is thus a folding of past-presents, present and the immanent future towards which we have our expectations formed, by both very recent past experiences (like on the millisecond scale) and grander expectational frameworks, which have accumulated through time, all of which goes into the durational span of now-horizon.

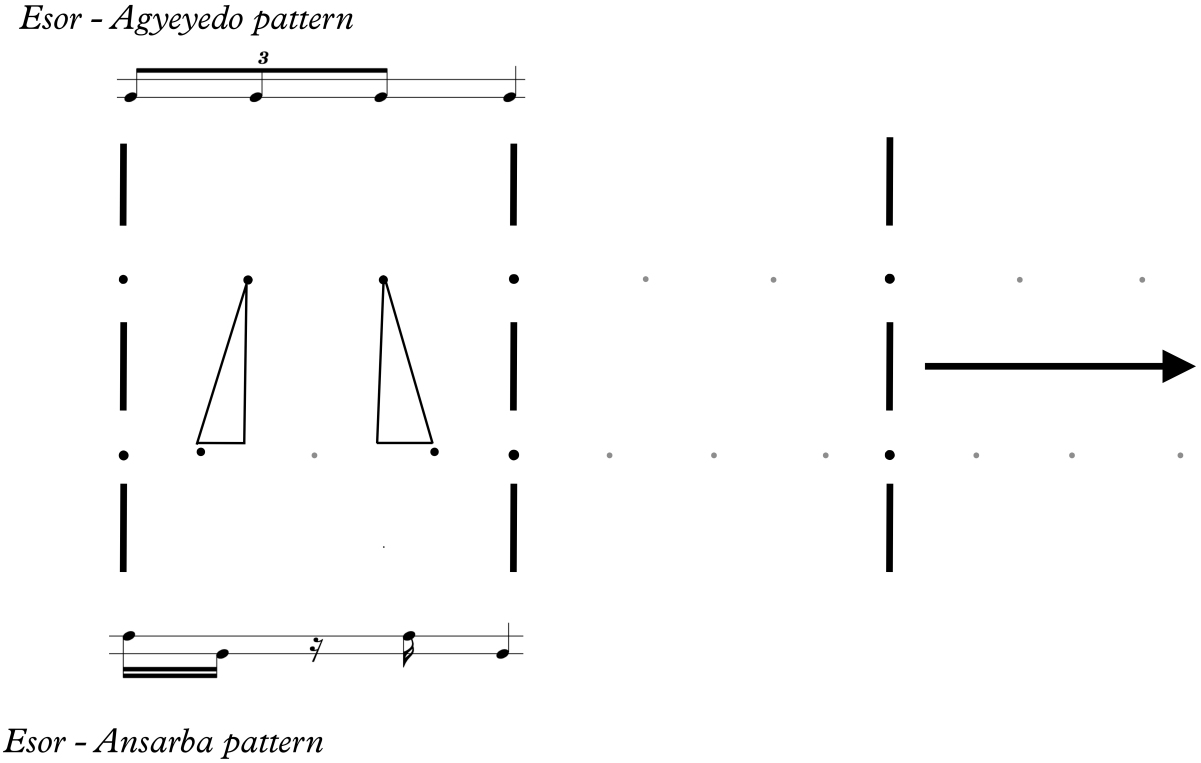
To this thinking, that which might constitute a continuum of a now-horizon is actually something that can exist on many temporal scales at once, and is organised through the way in which we choose to identify them. One such present might be that of a whole call-and-response dialogic exchange, shading off into a following coherent call-and-response exchange in an ever flow of cyclic processual progression - most importantly - on a micro temporal level this is what a beat span actually is - a durational temporal span of "now" present.

To Stover, beat span constitutes an affective force in music, outlining a span of present on the 'fastest' level of music perception and production, which spans from one point in one pulse cycle strata towards a moment on the other pulse cycle strata, which then again shades over into the next present moment. As to the temporal nature of these spans, Stover offers up the term of *near-simultaneities*:

> "The co-presence of these various strata result in what I just described as *near-simultaneities*, events very near one another conceived as nominally equivalent; that is, as occupying and contributing to the construction of a beat span." (Stover forthcomming, italics in original)

The introduction of near-simultaneity goes to describe a very curious and systematical phrasing differentiation within the Esor part between the Ansarba and Agyeyedo drums. These two instruments are recognised as playing the same prototypical rhythm-pattern in the way they relate with pattern of the Ampah drum (with differing melodies and stroke techniques), but individually choose to phrase these micro-rhythmically in widely different flexible ways (see Fig. 9). The Ansarba phrases its pattern much closer to a 2 and 3 onset along a 8-cycle pulse strata, while the Agyeyedo undergoes a stretching of its pattern into articulating a closer relation with the 6-cycle strata, while they are introduced as the same prototypical rhythm by the musicians, played on different drums. In terms of thinking of this example in beat span terms, one might say that the pattern is stretched in different, interesting ways while both hereby

inhabit the same beat span liminal spaces in a slightly different manor - or applying to the prototypical pattern a slightly different rhythmic phrase flavouring.



[Fig. 9: Esor part - Ansarba and Agyeyedo transformational model]

In other words, beat span is not a mathematical rigid string of durational metric-like beat spaces separate from the music, it is a living breathable construct constantly redefined by the collective creative inputs going into producing the collective musical process. It is a temporal space stretched out by all rhythms working as affective forces on each other, and not just a whole texture (given together, like in notation) of rhythmic strings of onsets, becoming meaningful up against one or the other metric substrate.

The widely praised and seasoned Afro-diasporic percussionist, teacher and writer Micheal Spiro, addresses this 16- and 12-metric pulse cycle superimposition a little differently than previous authors as he suggestively opens it up to the intuition as a spacial concept like that of Stover's liminal spaces of near-simultaneities, coining the term *fix* in the process, writing:

> "Instead of being evenly spaced, certain subdivisions are pushed closer together, which makes the time feel blurry. Half the time you can't tell if you're in a duple feel or a triple feel, and we're just not used to that ambiguity. Sometimes it even upsets us! I call this "averaging" of rhythm between

> a four and a six feel, "fix," (**F**our and S**ix**), and it is an essential component of learning to swing in these styles." (Spiro 2006, 38, bold in original)

Spiro supports several of the determinations suggested above. He, among other things, agrees with Takyi about the importance of a supplementary rhythm for practicing the right timing (phrasing) of one's own pattern. In Takyi's case he mentions that the resultant melody of two rhythms (melo-rhythms) is what informs him if he is playing/phrasing his own pattern right. In situations where one is practicing alone, one might sing some supplementary rhythm for this resultant melo-rhythm to arise. Spiro hints to a similar reality, as he states: "[…] until other instruments join in, you frequently may not be able to determine the time signature/feel from your own part. Secondly, and even more interestingly, there are styles of music like Rumba Columbia from Cuba, where both feels co-exist "naturally" at the same time." (Spiro 2006, 42).

This last statement is especially interesting for this current study, as the music mainly used for exemplifying beat spans often starts with one particular predominant cycle expressed by the music, and then "opens up" the beat span's space during the performance, as other instruments begin to explore and suggestively pull towards the other strata in interesting and creative ways.

The Asafo Ase part, meanwhile, seems much less suggestive in this department, given that groove doesn't seem to express/allude to predominantly a 6- or 8-metric cycle. Instead, I would say that the beat span spaces are already open and sounded by the groove texture from the very first moment of the performance, and the exploration is not so much an exploration of outer limits of differing metric strata, as it is an exploration of - and a collective tribute to - the various musical ways of expressing a communal melo-harmonic ethos, which seem to be front and centre in Asafo performance practice. It is in such a context in which Takyi offers the word/term *Ndoboa* - "to lean on each other" - for better explaining the mental posture needed of musicians (and dancers) to be able to act accordingly when participating in producing these metrically flexible musical groove textures.

A more recent addition to the range of possible namings of these spans has come from professional drummer Arthur (L.A.) Buckner in the context of a instructional YouTube video of learning how to perform the "The Dilla Feel", also sometimes termed Broken Beat drumming. Stating that to play the Dilla Feel (broken beat feel) on a contemporary pop drum set, one wants to play hi-hat, snare and bass drum onsets "in-between straight and swung - *Strung" (Buckner 2016 - timestamp; 1.4 min).*

Analysing *Communitas* Composition

In the following section I wish to summarise the previously stated concepts of ensemble groove composition presented in the previous chapters. First, I choose to address Asafo as a range of milo-rhythmic groove patterns constituting a multiplicity of relations, which both establishes them as patterns

in their own right and as parts of a large groove contexts, which I have chosen to term a *communitas composition*. Here are six central components of such multiplicity:

1. Ensemble groove patterns are in some fundamental ways melo-rhythmic constructs, which emerge from the coupling made by speech drum practice between tonal phonological features of Fante speech, reproduced on the drum head and later reduced in memory into their melo-rhythmic essences.

2. Melo-rhythms go together into constituting a resultant melody, which on a temporal level also produces a poly-rhythmic construct which between them produce a wave of syncopations from pattern onsets actualised in relative consonance and dissonance with each other inter-instrumentally. This inter-instrumental relationship could also be understood as vertically expressing a call-response rhythmic dialog. Most important to this is that the 'resultant melody' relation and the two melo-rhythmic patterns syncopation-relations co-exist as two co-occuring expressive phenomenon simultaneously.

3. Central to all groove building is a governing timeline pattern, which is driven forward by the dynamic interval of a breath cycle, outlining the beginning of the metric cycle to the beginning of a new one.

4. Timeline patterns outline a metric downbeat cycle, which is "picked" by the feet of audiences and dancers and syncopated against the timeline patterns all through a performance.

5. Master drummers hold a special status because of their intimate knowledge of rhythms through speech drum practise. Master drummers might therefore at any moment begin to articulate patterns freely within the groove. Furthermore, master drummers engage in speech drum or purely generative rhythmic improvised dialog, which might be expressed between patterns actualised simultaneously within the same cycle (horizontally composed exchange), or by call-and-response speech drum patterns being actualised alternately across several cycles (vertical composed exchanges) of musical unfolding.

6. The lead master drummer listens intently to the melo-harmonic ethos of the whole groove texture, and makes sure this is stable and "picks" proper melo-rhythmic material to add to the surface at any given time during the whole outline of the performance.

Groove as a Situated Participatory Mode of Experience

In the context of Asafo performance there are several identifiable group identities which occupy different modes of participating and modes (or levels) of experience. Specifically to this current analysis, it is determined that the totality of the musical process is understood as engaged with from the individual's situatedness and thus mode of participation. A thumping of the foot, a clapping pattern, a bell pattern or a master drummer speech mode exchange becomes grounding material for an experiencer entering into the musical experience and 'grasping' of the particular musical process, but, importantly, this standpoint is different for everyone, as every person has a different situatedness within the musical process. Taken as an audience member clapping or the instrumentalist playing the Adem bell, each interjects themselves (their consciousness) by way of *picking* a pattern and actively joining into a process with other rhythmic patterns that are in the process of being created, and herein their pattern becomes engendered as a ensemble groove pattern by its multiple and complex relationships to all other rhythmical parts, and unsounded affective forces of the musical process. But that which engenders, is effectively also the virtual force relations through which we perceive the musical process (Beat Spans).

In the Asafo performance, this is the individual functional relationships between drums, and socio-cultural relationships between master drummers, the ensemble instrumentalists, and the participating audiences. It is the compositional norms of an occasion, like the rhythmic formulations unfolded as speech drum utterances or their derivative melo-rhythms. It is the melo-harmonic ethos and their co-present melodic resultant rhythms, determined by the master drummer. It is all kinds of expectational conceptions, which work to direct and shape the music's processual unfolding.

In order to understand the nature of these co-present liminal relational concepts that flows through this epistemologically ungrounded theorising about experience and music production Stover appropriates a term offered up by David Locke's (2009) research into this multiplicity of relations making up West African traditional musics. The term is *simultaneous multi-dimensionality,* and is as a term - by Stover - meant to describe the liminal "both/and" idea which exists in these co-constituting relations and identity formations happening within a timeline musical-process like the Asafo performance. This term describes the liminal epistemological concept, which is foundational to the liminal thinking suggested throughout this thesis. As we have moved from a music theoretical thinking, grounding rhythms in relation to a fixed psychological hierarchy of meter, into a thinking about rhythms as patterns becoming engendered as rhythms through their ongoing and diverse relations with all other patterns, as well as with affective forces - like a beat span cycle - which are not just virtual constructs, but in a very real sense is also present in the music's sounded texture (which we shall be occupied with computationally mapping shortly). This is the topography of that to which Stover appropriates Locke's term simultaneous multidimensionality and furthermore also explains the nature of the poly-metric pulse cycles asserting metric gravitational pull on onsets within the liminal beat spans, suggested by Stover.

Together these concepts outline some recognisable streams of thinking, which still to this day impact research into groove timing and perception, namely that of Charles Keil's theory of groove - Participatory Discrepancy

Participatory Discrepancies: The Nuanced Play Within Beat Span

"And since it seems that much of whatever groove or sound in question is subliminal, variably in and out of awareness, we have to further develop theory and methods beyond straightforward ethnography if the participatory discrepancy (PD) paradigm is to carry the day." (Keil 1995, 2)

"*What laboratory measurements are possible to further confirm good matchups between #1 and #2 or shed light on areas of disagreement? Can we wire up the contact points on fingers and drumsticks? Can we graph very precisely the acoustical phenomena and measure the actual discrepancies in time and pitch? […] Can we graph very precisely the acoustical phenomena and measure the actual discrepancies in time and pitch? […] Confident that these participatory mysteries will never be more fully resolved than the mysteries of small particle physics or the further reaches of the univers,*

I'm ready to call in the engineers and start exploring"

(Keil 1987, 279, my italics)

This multi-relational and multi-stable process theory of music has its roots in the very astute and eloquent writing and theorising of Charles Keil, who in 1987 suggested the notion of participatory discrepancy as a inherent quality to the process of groove. Participatory discrepancy is described as "inflection, articulation, creative tension, relaxed dynamism" and "semiconscious or unconscious slightly out of syncness", which he theorises are inherent to all musical experience that can be said to groove (Keil and Feld 1994). According to Keil's theory of groove the "little discrepancies" are both an inevitable and desirable product of active human participation in the music-making process, stating: "[…] music must be full of discrepancies, both "out of time" and "out of tune" (Keil 1987, 279)

According to Keil it is commonplace, and desirable for musicians to be slightly out of sync, and if not (as is the case of some music from the age of digital reproduction), such a "musician" might be the active participating listener, who co-produces their own musical experience by stomping away on the dance floor to the minimal techno tracks of 00's underground Berlin club scene (a suggestion made in Garcia 2005). But the discrepancies are there, in the process of actively moving, thus participating and experiencing. Keil talks of groove fundamentally as a multi-stable ever evolving process of relations,

which is echoed by the determination made by musicians when composing and performing Asafo performance and by the mental posture of "leaning on one another" expressed by the term *Ndoboa*:

> "There is no essential groove, no abstract time, no "metronome sense" in the strict sense of metronome, no feeling qua feeling, just constant relativity, constant relating, constant negotiation of a groove between players in a particular time and place with a complex variety of variables intersecting millisecond by millisecond. Abstract time is a nice Platonic idea, a perfect essence, but real time, natural time, human time, is always variable." (Keil 1995, 3)

In his own way, and very much in the same spirit of the ending of the previous section, Keil goes on to refer to participatory discrepancy as "Particles Dancing", and to the points made about the participatory mode of music making driving a non-alienating *communitas,* Keil writes: "PDs have everything to do with pleasure in the Public Domain: the presence of shared tradition and an ever deepening sense of the subtle ways in which wrights and rites, skills and events, craft and culture, are connected in public space and time." (Keil and Feld 1994, 107-108).

I, as well as Stover, takes the slightest of issues with Keil's choice of the word "discrepancies", as the epistemological nature of the respective ungrounded theories of music as process, doesn't distinguish one element of the musical texture as more or less rigid or determining of others, and even metric constructs are both born by rhythms and works to engender them at one and the same time. Thus, the wording groove arising from *discrepancies* - meaning something with is considered definite and something which becomes defined in relations to this - doesn't really function within this line of thinking. This is due to the ungrounding principle of this theoretical thinking, which doesn't favour any particular rhythmic or metric structure as the backdrop onto which some other patterns become discriminant against. This is even though Keil's picturesque presentation very much aligns with the determinations suggested above.

Thus, Keil's participatory discrepancy is also referred to, by Stover (2009), as 'the nuanced play within a beat span' communicating the nature of a multi stable ever evolving musical process, akin to particles dancing, which work to create a non-alienating communitas through its negotiating, and continues collective process of (in the Asafo context) a melo-harmonic ethos and occasion. This basic notion, together with the rich and interesting universe of musical determinations and creative invention in the Asafo performance practice, is what has prompted the rest of the exploratory research presented in this thesis. I will now go into the second half, zooming into the Asafo ensemble performance's instrumental micro timing. Firstly I will go through the process of data gathering. Then I will proceed into relating a selection of rhythmic patterns with each other and with the overall ensemble rhythmic texture.

In the spirit of Charles Keil, I have taken on a situated analytical design for computing timing relations, as I wish to avoid making too much "averaging out" of experience. This means that I, throughout the

following section, insist on making a subjective (situated) timing analysis, choosing one particular pattern as that which all other instrumental actualisations become related to - or which all other particles dance around. Other approaches have ben taken earlier, as with Polak and London, looking into Maline percussion ensemble playing, who choose to average out the metric cycle beginning which is used for computing all other instrumental onsets relative timings. Such an approach is not favoured by this current theorising, as it fundamentally is a theory based on a subjective situated actor, operating and relating within a simultaneous multi-dimensional context and not an analysis trying to disclose an averaged out "objective" perspective on a process of simultaneous multi-dimensionality, as such a perspective doesn't describe any one situated participant's experience.

As earlier stated and now prompted by Stover's interpretation of Keil I wish to ask the following research question:

(1) *Do Asafo groove instruments flexibly pull rhythmic patterns into different metric realms simultaneously, as is described in literature about African and Afro-Diasporic tradtional timeline music?*

(2) *Do Asafo groove instrumentalists time their onsets more consistently relative to their inter-instrumental pairs, or relative to the beat span grid?*

In order to answer these questions, I wish to look at several timing relations between:

- Asafo Ensemble Groove patterns average onset timings and standard timing variability (SD) relative to a beat span grid with the Agye bell timeline as its RelTP-pattern.

- Asafo Ensemble Groove Pattern's inter-instrumental onset timing (Avg. IOI) and standard timing variation (SD).

From inspecting the results of standard variation (SD) of the Onset/beat span grid-points timing analysis a question is added:

- What can explain the increase of SD as a function of the moment of onset placement within the unfolding of the RelTP-cycle?

But before presenting results, a novel computational tool was designed, to be able to display the timing relations of onset relative to virtual beat span spaces.

Chapter 4: Methodology

In the following section I will go through the steps of gathering data for the micro timing analysis of the Asafo ensemble groove:

- Recording the Asafo performance
- Music Information Retrieval Attack Detection Procedure
- Design and Computing of the BeatSpanner Toolbox

Recording Session - Conditions and Musicians

The rehearsals and recording day were carried out on the 5th and 6th of December 2020, at the culture venue Union (formerly known as “House of World Music Cultures and Arts”, in Copenhagen). The eleven participants (seven of them instrumentalists) were made aware of the scope and purpose of the project by Takyi before agreeing to their involvement. Likewise, Takyi negotiated salary for the group members, together with a second individual from the group. Payments were also later handled by Takyi, as he had access to all participants’ banking information. Takyi was my main link and contact to the participants of the group, who all are born and have lived in the same area of Cape Coast as Takyi. Most of the participants considers themselves insiders to the culture of which Asafo war-dance performance is a part. Meanwhile, a couple of individuals of the group were not frequent performers of Asafo, and all besides one had performed as part of a Asafo group at one period of their life.

Participants agreed to two 1/2-workdays: one session being a rehearsal-day, spanning from 4 PM to 9 PM, and the second performance day spanning from 4 PM to 8 PM. All participants were offered bottled water and soda, as well as a meal both days. Two performers came from another region of Denmark to be part of the rehearsal and recording session. Both individuals were compensated for their travel expenses. On the first day (rehearsal day), the musicians were briefed about the two day program in more detail, while the performance-related details were left to Takyi to be determined. In a prior, Takyi and this researcher had conversations about what Asafo occasion would be imitated in the recording session, and as mentioned earlier, we settled on the performance format akin to celebration of the “passing of the cycle of time” happening in the end of July at the Oguaa Fetu Afahye festival. This is because it doesn’t depend on the involvement and presence of a traditional priest, and because it was an occasion that most of the participants would have experienced and participated in.

The second day’s program (recording day) consisted of two whole Asafo performances. First performance was to be considered a dress rehearsal with costumes, dancers, song (and full focus), and the second performance was to be considered the main performance. Both performances were recorded. All

participants agreed to these conditions and didn't express any questions about this aspect of the recording process. My own role as researcher was as a facilitator, making sure that performers were informed about the project, the planning, rules, rights as participants, meeting hours, as well as making sure that they were comfortable and hydrated. I was subsequently assisting the sound technician with placing of microphones and making decisions about how to capture the sound signal best for the purpose of later timing analysis. After the performance a short group talk was performed and all instrumentalists where happy with the final performance recording which was also the one used for this thesis. One important thing which all participant lacked under the conditions was participating audience and performing this outside in Cape Coast setting, as this adds energy and vigour to all parties as performance is recognised as only one part of a great social occasion. This echoed the same intentions had by myself as I embarked on this master research project before COVID-19 changed the world situation and travel to Ghana was not a option.

Performance Setup

Recordings were done in a constellation as close to that of a regular performance at the festival setting in Cape Coast. This entails all three bell players standing from left to right in the following constellation, seen from the perspective of a front facing audience - see picture 3 and 4 from the recording session below:

(1) Adem (Supporting Bell) (2) Aponsa (Master Bell) (3) Agye (Timeline bell)

To the left of this constellation sits 4 performers playing drums (again from left to right)

(4) Agyeyedo (first supporting master drum/first supporting master drummer), (5) Opusu (Master/elder drum/lead master drummer), (6) Ampah (first supporting drum/second supporting master drummer), (7) Ansarba (Second supporting drum).

Behind the instrumentalists stand one male singer and three dancers (two male and one female) in the following constellation:

(8) Male singer, (9) Male Dancer, (10) Male Dancer and (11) Female Dancer

Everybody in the group sings or chants at one point or another during the Asafo performance, while both the male singer and three dancers continue to sing for most of the performance, whenever they are not dancing. Dancers take turn to enter the performance space in front of the orchestra, as they fill out their part in the performance. Only a few participants from the instrumentalists families where present for the performance recording.

[Pic.3: Instrument Set-up]

[Picture 4: Performing group]

Microphones and technical specifications

Given the nature of this research, looking at the smallest level of temporal interaction in music production, it is imperative that we do not risk disturbing the performing actors in a way which might cause them to engage with their instruments in any constrained or uncomfortable way, as well as not disturb their collective interaction visually or auditory. I consulted Takyi about this matter in advance, and it was concluded that one first and foremost should try hard for the microphones not to restrain the musicians' proximity to each other, as well as their ability to move around on their chairs. Naturally, this meant that separating the musicians into different recording boxes or areas of a recording space was not an option. Neither could we use electronic drums and headphones, given that this would have huge influence on their auditory experience and timing estimation. Also we needed to mind the airspace over the heads of the drums, due to excessive hand gesturing being an important tool for communicating timing cues to the other players.

As for recording strategy, we ended up deciding to use two different microphones. One contact microphone on each instrument, aiming at capturing a clear undisturbed audio signal from each instrument, which would be used for onset detection made possible by the post recording Music Information Retrieval software. Furthermore, a dynamic microphone was placed cm from each instrument, aiming at capturing the music as a totality together with the acoustic features of the concert hall. All contact microphones were of the same type and brand - Harley Benton HB-T - stuck to the instruments with sticky tack. A week prior to the recording session, the sound technician Takyi and myself made several experiments with placings of said contact microphones on the drums and bells, both trying

to accommodate for good and steady signal strength as well as maximising the comfort and convenience of the players, so not to be forced to change playing strategy. The results showed the bell's were best miked by placing the microphone on the bells bottom part, which is cord running through along the arm of the bell player. This is because all bells were handled by one hand, cuddling the bottom of the bell from underneath while pointing obliquely upwards. When held in the hand, the bell is mildly muted by the palm and fingers but when a more open and ringing tone is sought, the palm and fingers push the bell upwards and subsequently drop the palm slightly, for the bell to hang momentarily in mid air, unmuting it. The signal from three bells were all relatively noise free and no major technical problems were experienced during both dress rehearsal or recording. Bell players seemed quite undisturbed by the placement of the contact microphone when asked about it in rehearsal, and didn't seem to make any change to their technique, because of the microphones placement according, to Takyi's assessment.

In terms of miking up the drums, there was trouble getting a strong enough signal while the microphones were placed on the drum-kettle's side and this would potentially compromise our ability to distinguish different types of strokes as well as dynamically weaker onsets. Instead, the contact microphone was stuck to the outer parameter of the drumhead, where the head meets the barrel edge and wraps around it. The mic was placed on the part of the drum head facing away from the player, so to not be in the way of both palm and stick strokes. This had the benefit of not muting the head in any noticeable way, while still picking up all the timbral features disclosing the tactility quality of each type of stroke. For the sake of clarity came the compromise of noise, like drags, scratching, occasional striking of microphone and double registering of onsets due to excessive resonance. All of this was carefully and methodically sorted as part of the data organisation process.

While this placement worked very well on most of the drums, it showed to cause some problems on the Opusu, lead master drum. Given the nature of these drums' usage under varying circumstances (outdoors and indoors), the drumheads were of varying quality, condition and cleanliness. Especially the master drum, which is beaten excessively and hard throughout the performance. Its head was partially covered in some sticky resin-like residue, which ended up preventing the sticky tack from properly sticking. This amounted to the sound technician at one point having to re-stick the contact microphone to the drum. This fact led to the master drum's signal suffering clarity, but as this instrument is not added to the final analysis of ensemble groove, this problem has not had huge impact on the final results.

Secondly we placed one dynamic Shure SM58 stage microphone ≈12 cm from each instrument, choosing this type for its convenience and familiarity to the sound technician and instrumentalists, as well as its availability and cost efficiency. We also used a pair of Shure SM81 condenser microphones for recording the singing done by instrumentalists and dancers. The microphones were placed in the back of the orchestra, hanging 2,5 meters directly above both musicians and dancers.

Recording equipment and formats

The performance was recorded onto a Macbook Pro 13" retina from 2015 using Logic Pro X without any plug-ins added. The recordings were done in RAW-format, Mono and bounced in wave-format (44,1 kHz, 24 bit sample rate) without dithering. A X18 air Bheringer was used as mixer/pre-amp, again without compressor and other effects. For short, signals were sent directly from dynamic microphones and contact microphones amplified through a preamplifier, and recorded into the Logic project. All cables used were Neutric xlr and neutric adapters from xlr to jack. No adjustments were carried out during or in-between the performances, as all noise levels were checked beforehand and great care was taken when setting gain levels so that mics didn't capture bleeding signal from other surrounding instruments. The individual contact microphone recordings were then gained 15db-20db, using the open source Audacity softwares's *Amplify* function, to make strokes more distinguishable for the MIR onset detection function.

Music Information Retrieval Toolbox and Onset Detection

The Music Information Retrieval toolbox (MIR-toolbox) is a digital set of tools created for use in multi paradigm programming languages and numeric computing environment MATLab R2019b. The MIR-toolbox proposes a large set of musical "feature extractors", which are build on a set of building blocks

that can be parametrised, reused and reordered for the purpose of music information retrieval (MIR), modelling and analysis (Lartillot 2007, 2008). For the operation of extracting the onset timepoints there were used the attack detection function: “o = mirevents(‘sample-track’,’attacks’)”, using the default 100 ms frames size and 10% hop-size. Finally all onset timepoints were exported as timing data I a spreadsheet using the “mirgetdata(o)”. All instruments onset timepoints where en sorted and grouped while listening to their individual recoding and both starches, unintentional drags, mic-striking where omitted as data points and instrumental variation of the ensemble groove patterns where also excluded, to only be left with the main groove pattern of each groove instruments. How all patterns where organised and colour coded can be seen in table 1 and 2 in online appendix.

Computational mapping of beat span

For the current study, a new computational BeatSpanner Toolbox (BST) was created, that produces four types of plots displaying and relating onset timing in different fashions, relative to an beat span grid, made up of two idealised superimposed metric pulse cycle grids, which delimit the outer parameters of a given beat span cycle:

- Beat Span Cycle Grid Plot
- Onset Weight Plot
- Average Cycle Weight Plot
- Single Onset Weight Plot

All tools of the Beat-Spanner toolbox have been designed by the researcher and computed in collaboration with computational sciences Ph.d. student of at the University of Copenhagen, Pernille Emma Hartung Hansen. The toolbox was written in the widely popular Python language, using a Web-based interactive computing notebook environment - Jupyter Notebook 6.1.4.

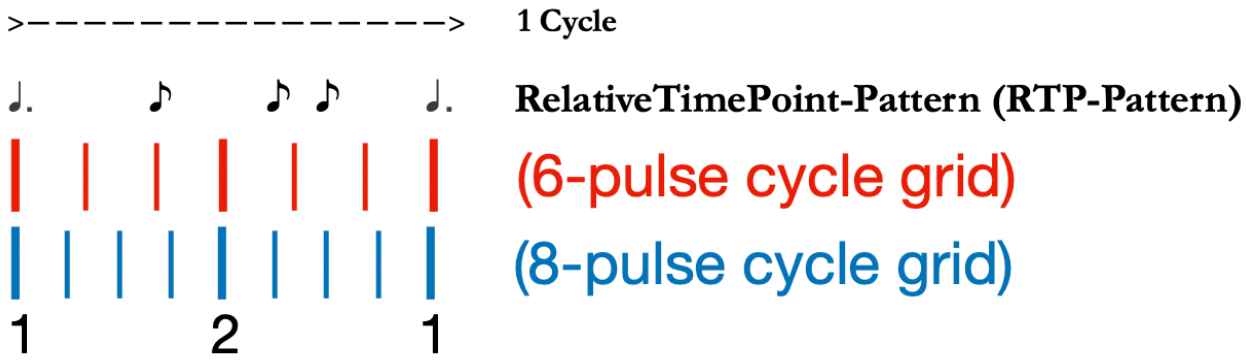
What the researcher seeks to accomplish with the BST is to display and contextualise the micro timing of instrumental pattern onsets relative to the two idealised superimposed metric pulse cycles out stretching beat span space.

All four plot types are constructed using two types of data. The first is a body of consecutive cycle beginning points specific to a given repeating rhythmic pattern - also referred to by Anku (2000, 2007) as Referential Time Points (or RTP - e.g. this might come from the Agye bell timeline pattern). The second is the total body of one or more arbitrary instrument’s onsets. The instrumental pattern used for extrapolating the Referential Time Points will from this point onwards be termed the *RelativeTimePoint-pattern*, or *RelTP-pattern*. This RelTP-pattern will for the whole thesis be that of the Agye bell timeline

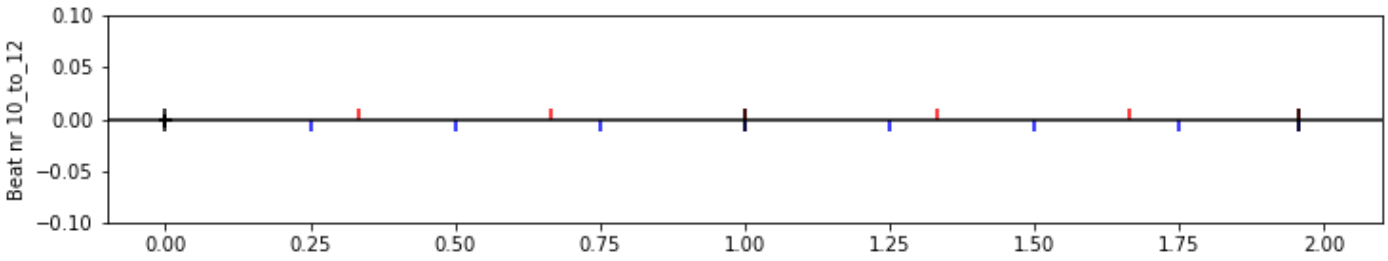
pattern, as this was what the instrumentalist identified as their governing metric-like reference structure in the Esor part. The Agye RelTP-pattern's "beginning onset" marks out the specific Asafo ensemble's cycle periodicity and is subsequently also used to calculate the two superimposed beat span grids, which all other onsets in turn become micro temporally related to.

Plot Type 1: The Cycle Plot

The computational procedure starts by calculating the time points which should make up the superimposed metric pulse cycle plot. This is accomplished by taking two consecutive beginning points expressed by the RelTP-pattern, and compute the time points of both of its traversing 6 and 8 metric pulse cycles respectively, making up the BeatSpan-grid. This is carried out by subdividing the total inter-onset-intervals between the two consecutive cycle beginning points by a factor of 6- and 8-respectively. This procedure is repeated for all periodicities expressed between two consecutively stated beginning points in the RelTP-pattern data set, creating an RelTP-BeatSpan cycle grid-plot - **Fig. 10** show the elements going into constructing an RelTP-BeatSpan plot and the following **Plot 1** shows an empty BeatSpan grid-plot.

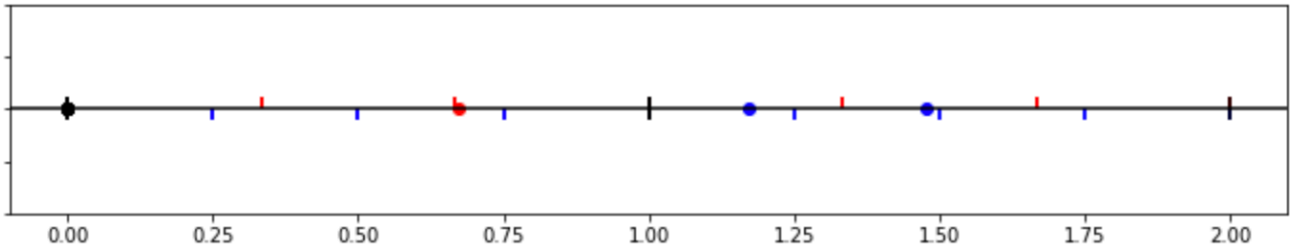


[Fig. 10: Cycle, RTP-pattern, 6-cycle and 8 cycle, Downbeats]



[Plot 1 : Empty RelTP-BeatSpan grid-plot]

Relative to this, the analyst can introduce a given body of instrumental onsets (these might be from one or several instruments simultaneously) and map these onto the RelTP-BeatSpan grid-plot, these onsets are forwardly termed s*urface onsets* and their instruments and patterns are known as *surface onset instruments* and *patterns*. The final product becomes a plot, marking out individual cycles' downbeats with black vertical lines and the two individual pulse cycle time point grids, with blue (8-cycle pulse grid) and red vertical lines (6 cycle pulse grid points). All surface onsets receive a colour relative to the cycle time point which it is closest to, just to give a very vague idea of each onset's relative temporal closeness to either outer cycle parameter. This plot is named a *BeatSpan Cycle Plot* (or C*ycle Plot* for short), and is mainly used for clearly visualising specific onset timings relative to the RTP-BeatSpan grid-plot (see **Plot 2**: Ase - Agye timeline pattern plottet in the Cycle plot beneath).



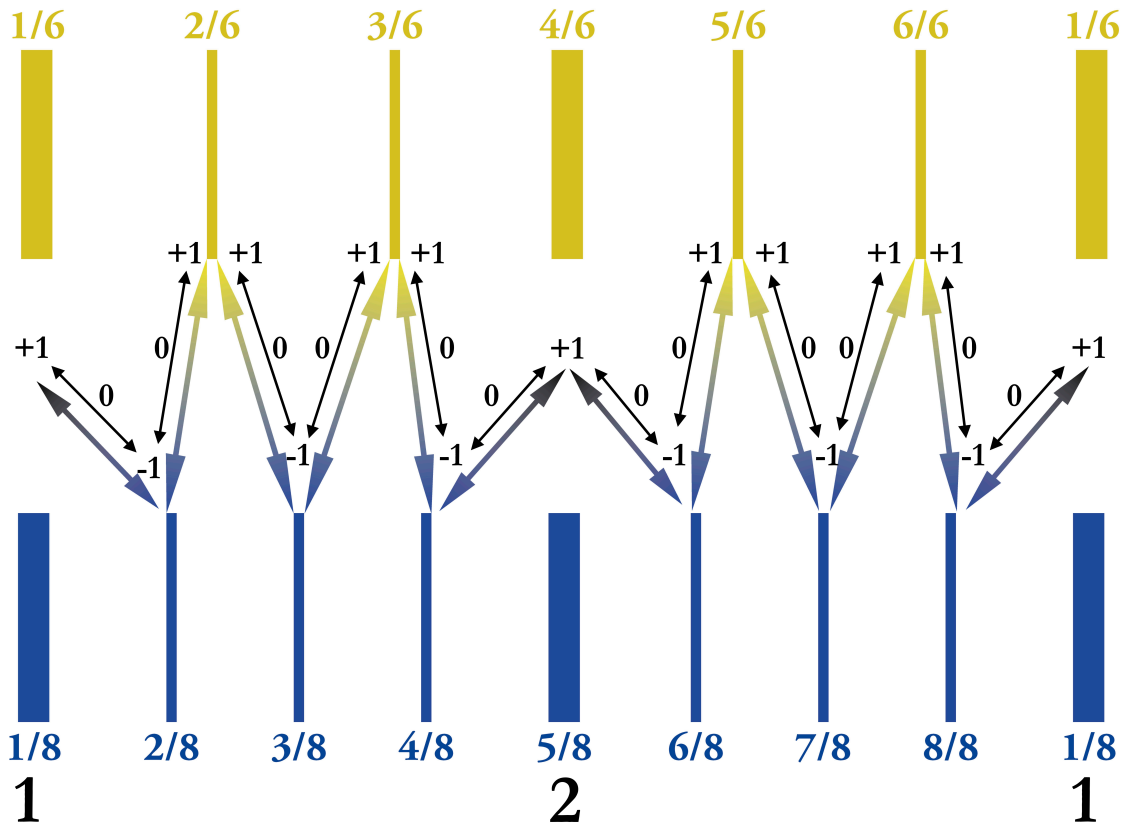
[Plot. 2, Cycle plot - Ase - Agye bell Timeline pattern]

Meanwhile, this binary onset colouring strategy is actually in direct contradiction with the engendering happening to an onset temporal realisation within the liminal beat span spaces. A more adequate mapping would display a given onset's dual status, by becoming engendered by both gravitational forces exerted upon it by both superimposed metric pulse cycle strata. This liminal quality afforded Surface Onsets actualised within a beat span, is much better expressed by an analytical strategy that allows for non-deterministic categorical organization. For such purpose, a computational procedure was developed, which takes the RTP-BeatSpan grid plot, and adds a second dimension to it, so to display the temporal location relative to the outer parameters of beat span. This meant using the y-axis for indicating the qualitative nature of a given onset's micro temporal closeness to both of a beat spans outer parameters at once.

Plot Type 2: Onset Weight Plot

This second plot type is called the Onset Weight Plot, and visualises all surface onset's micro temporal positions within a given beat span stretched out between the time points of the superimposed 6- and 8 -pulse cycles (Fig. 11). Given that beat span is in fact a liminal space, marked out - in this empirical study

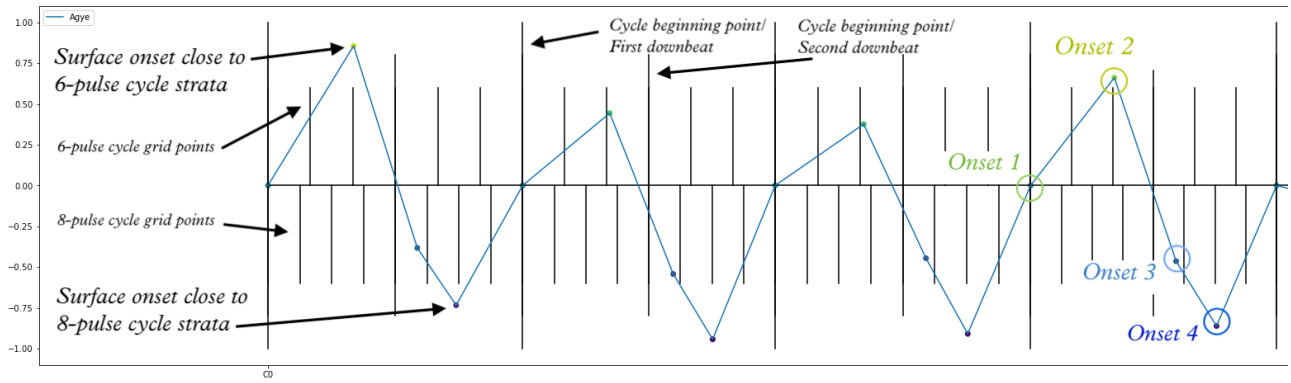
- by two mathematically incompatible metric pulse cycles, what the Cycle Weight Plot needs to accomplish is to describe the presupposed non-deterministic and simultaneously shared relationship with both outer pulse cycle parameters making up the liminal space of beat span. Thus I choose to utilise the y-axis as a parameter expressing a surface onset's relative actualisation within the qualitative near-simultaneous liminal space time of beat spans.



[Fig. 11: Liminal space factors]

An onset's placement on the y-axis expresses its micro temporal closeness relative to the timepoints both simultaneously the 6- and 8-pulse cycle strata. The metric cycle weight of an onset describes its 8-pulse cycle or 6-pulse cycle character as a continuous quantity ranging on the y-axis from +1 to -1 respectively.

As an additional visualisation of the same beat span weighting quality, there has been added a coloured aspect to the Cycle Weight Plot, which follows the same relative measure of closeness to time points on the two outer cycle parameters, but is expressed through a colour nuance ranging from dark blue to light yellow (with a green-ish middle). On the x-axis all onsets are plotted in relation to their consecutive temporal realisations. Similar to the previous Beat Span Cycle Plot, the black vertical lines on the x-axis marks out the beginning of the RelTP-metric cycles. Furthermore, the 8- and 6-pulse cycle grid lines are represented on the negative (8-pulse cycle) and the positive (6-pulse cycle) side of the y-axises,. See plot 3.



[Plot 3: Weight Cycle Plo - Ase - Agye Bell Timeline pattern]

Before finalising this computational protocol and subsequent plot design, two special ambiguous liminal spaces of the superimposed 6 and 8 pulse cycle have to be dealt with theoretically.

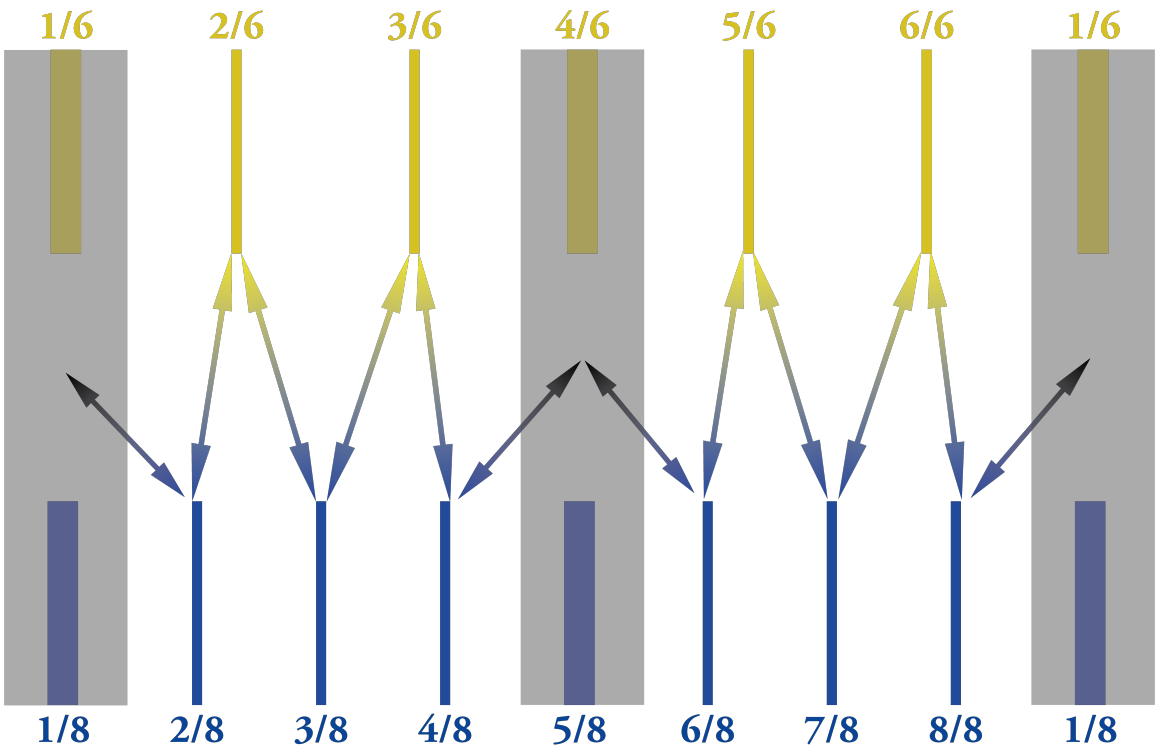
Beat Span Dark-zones - Dealing with Non-determinable Beat Span Spaces Around Downbeats.

In eight out of the twelve beat spans, the liminal spaces are outstretched between virtual grid points from both the 8- and 6-cycle. Meanwhile, four of the beat span spaces are stretched between two points wherein one of them is a downbeat position - see Fig 11. What becomes the problem at this point, is that when calculating the onset weights for onsets actualised within the preceding and proceeding liminal space of a downbeat, the “metric pulse cycle”-identity of the downbeat grid-point is ambiguous, as it both could be said to assert an 8 cycle or/and 6 cycle gravitational pull on onsets actualised near it. Thus, it is needed to find a consistent way to theoretically and computationally treat onsets actualised within these discrete liminal spaces.

Multiple approaches for determining the cycle weight (and thus the gravitational quality of the forces pulling on each beat span from the downbeat position in the model) of downbeat grid-points is sought out. Amongst the tempting solutions was to average out the weightings of all onsets actualised within the regular beat spans in the currently unfolding cycle, and let the overall average of these onset’s weight decide if the beginning and middle downbeat should "take on" the gravitational force of a six- or eight-pulse cycle time point. This approach, meanwhile, is abandoned as it introduces a level of determinism which isn’t compatible with the definition of beat spans. Beat span is a durational now-horizon unfolding as part of a musical process and is not given a prior outside of the temporal unfolding of musical patterns. Instead its unfolding is inseparable from the patterns and affective pattern relations which in reality is what effectively comes together to outstretch its liminal beat span spaces durational qualities. Therefore average weighting determination of earlier or later onsets, can’t come to bear on the qualitative weighting determination of onset realised within earlier or later unfolding beat spans.

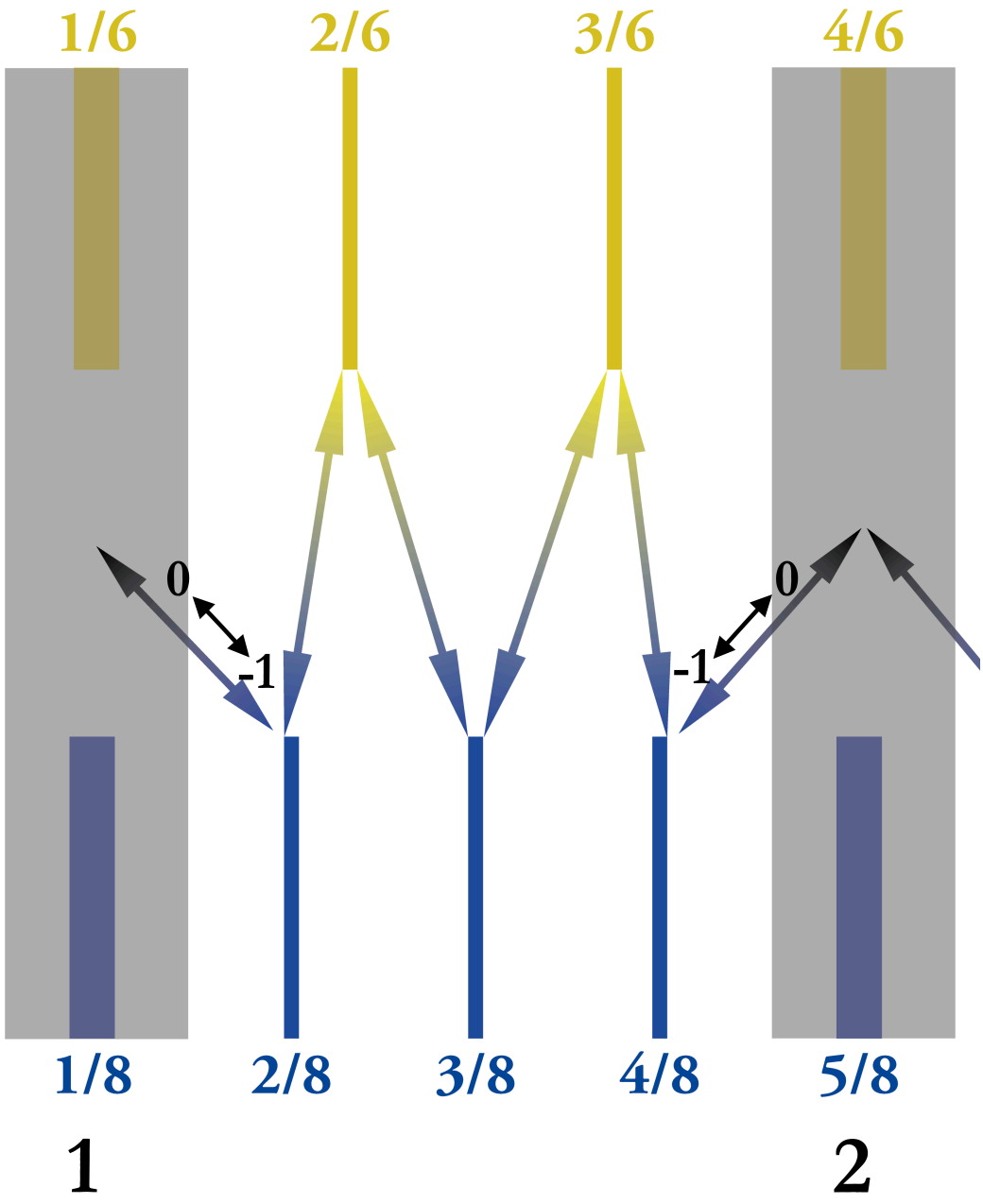
This notion effectively leaves the identity of both of these downbeat position time points secondary, as no rhythmic pattern in (especially) timeline music, is believed to be aesthetically evaluated by the determinacy of onset's synchronicity with any single idealised isochronous pulse cycles strata making up the temporal outer limits of beat span. Instead, as hypothesised in research question 3 on the grounds of the performance and compositional practices outlined in the three first chapters timing qualitative determinacy is much more centred around how inter-instrumental relations are produced and mentioned during a performance.

Thus, instead, I opt for a less deterministic interpretation of this ambiguous metric position and choose to not determine the *onset-weighting* of onsets actualised closely before and after a downbeat - effectively leaving each half of the beat span, surrounding the downbeat position, to become metric *Dark-zones*, see **Fig. 12**.



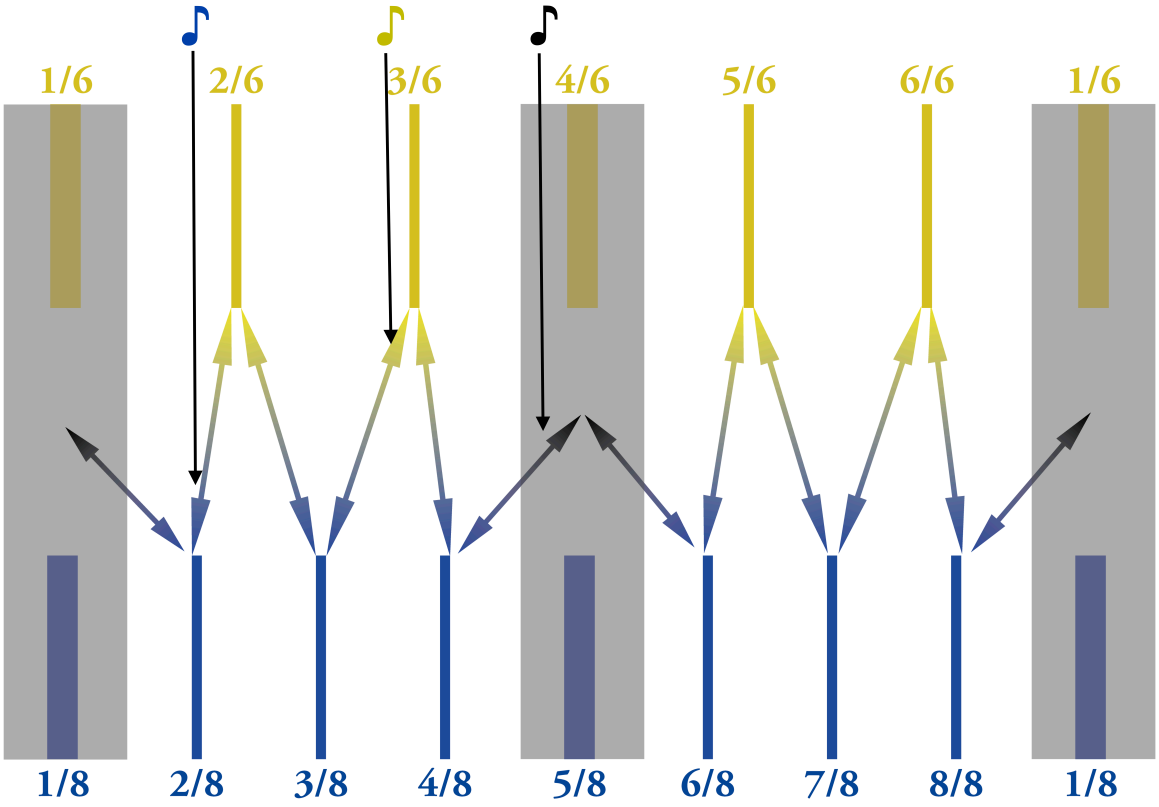
[Fig. 12: Liminal figure with Dark-zone's]

This effectively means that all onsets actualised within a given dark-zone around both downbeats in a RelTP-cycle will be plotted at the y = 0 in the Onset Weight Plot. The half-liminal space preceding and following the dark-zone will still weight onsets within a range from y = 0 and y = -1 and these onsets will receive a colour nuance ranging from blue/yellow-ish to dark blue, as they are actualised close to an 8-cycle time point on each side of the downbeat dark zone. This weighting range will also apply when computing average cycle onsets (which will be outlined next) - see **Fig 13**.



[Fig. 13: Liminal mode with Dark-zones and halv liminal space]

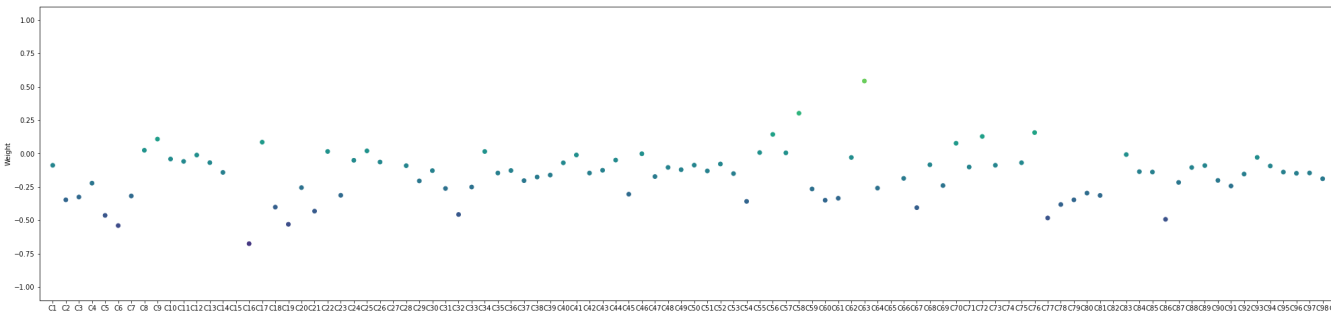
This leaves the Onset Weight Plot to display onsets within two types of spaces. The liminal space stretched between 6- and 8-pulse cycle grid-points or within the dark-zone forming around each shared downbeat position in the RelTP-pattern metric cycle - see **Fig. 14**.



[Fig. 14: Shows all three types of onsets weighting options - one onset close to a 8-cycle time-point, one onset close to a 6-cycle time-point and one onset within the Dark-zone,]

Plot Type 3: Average Cycle Weight Plot

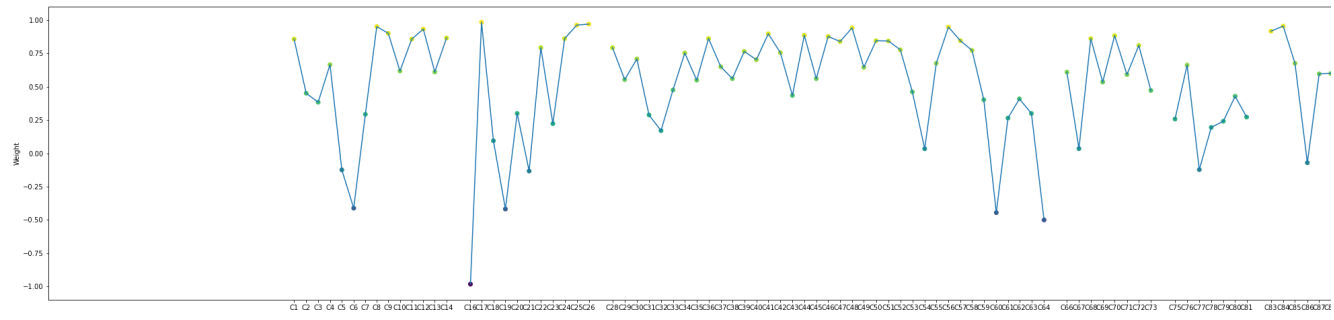
Additionally, an *Average Cycle Weight Plot,* was computed to show an overall change in average onset weighting of surface onsets within a whole cycles at a time. This is done by taking the average weighting of all onsets actualised within one cycle iteration (besides those actualised within the Beat span Dark-zone), and computing their average weighting into one cycle weight average. This average cycle weight is then plotted as single dots along the x-axis marking out the specific cycle, which the dot represents, and the y-axis and colour displaying the average cycle weight on the same scale from -1 to +1 as in the onset weight plot - see **Plot 4** showing the first 89 average cycle weights of the Ase, *Agye* timeline; S*urface Onsets* plotted in an *Agye; RelTP-pattern grid-plot*. Each dot displays the average cycle weight of onsets actualised within the particular cycle indicated on the x-axis beneath.



[Plot 4: Average Cycle Weight Plot - Ase - Agye timeline pattern]

Plot Type 4: Single Onset Weight Plot

Finally, a plot function was designed which isolates one specific onset with a repeating pattern and displays this specific onset's weighting across several cycles. This computation was made in order for the researcher to look at specific onsets actualised on the same position within a specific repeating Surface Onset-pattern (e.g. only the first onset of the Agye pattern, or only the second onset of the Adem pattern, ect…) and visually display all of these across several RelTP-BeatSpan cycles. This will be used to assess the qualitative micro timing changes of one specific onset in a pattern across longer periods of the performance. In **plot 5**, all second onsets of the four onset long Ase - Agye timeline pattern is displayed across 32 cycles. In this example, the RelTP-pattern used in order to generate the RelTP-BeatSpan grid-plot is that of the Agye pattern itself. Lines are drawn between individual onsets so for the consecutive order of the onsets to stand out more clearly and enhance the visual representation of changes in micro timing of each onset across multiple metric cycles. Where no line is drawn, a cycle has been omitted in the data organisation process.



[Plot 5: Single Onset Weight Plot - Ase - 2. Onset in the Agye Bell Timeline Pattern, from cycle 1 to 32]

Thresholds for Average Asynchrony and Standard Timing Variation

The results section will be to part, and overall focus on looking at two different timing relations, to answer the two different research questions:

- Instrumental pattern and Timeline BeatSpan pulse cycle asyncronisity timings and standard variation:

(1) Do Asafo groove instruments flexibly pull rhythmic patterns into different metric realms simultaneously, as is described in literature about African and Afro-Diasporic tradtional timeline music?

- Inter-instrumental timings asyncronisity and standard variation:

(2) *Do Asafo groove instrumentalists time their onsets more consistently relative to their instrumental pairs, or relative to the beat span grid?*

Before going on to look at results we firstly need to set some values for relating onset/beat span pulse grid timing and timing variations, to determine when a onset is significantly "asynchronous" with a grid point to a significant degree, for it to be deemed a somewhat (conscious/unconscious) intentional act. Furthermore the same is needed for inter-instrumental onset timing relational variation.

Average Onset/Pulse Asynchronicity and Standard variation

When looking at percussion pattern timing relations to metric pulse cycle in West African percussion ensemble music, it seems obvious to look towards Polak and London et al.'s (2016) study of instrumental micro timing in three different drum ensemble musics (4 instrumentalists) from Mali. While Polak and London theorise that instrumentalists relate their onsets to a Non-isochronous (NI) metric pulse cycle (in durational triple and duple categories; Short-Long-Long or Long-Short), their results still can give us some ca. estimate of the average variation of onset in a west African Ensemble context. In Polak and London's study - very much contrary to the current study - the cycle beginning point was not computed from the main timeline pattern of a given piece, but was calculated from the average timing from all instrumental onsets (of all instruments) actualised within a range (a metric bin) around the first onset of the main timeline jambe pattern of the piece. From this mean, all asynchronies of instruments were computed relative to the grid plot produced from this "averaged out" beginning point. Results showed that asynchronies across all three pieces of music were as small as 6-12 ms (or what amounts to 2% of the local downbeat duration, with a downbeat IOI of 300 to 600 ms), and shown to vary with tempo, but not between music styles.

By this standard, average onset asynchronies between similarly placed onsets relative to the beat span grid-points should amount to approximately 8,5 ms for the Esor part (avg. downbeat duration of 414 ms).

Meanwhile, Polak and London's results are fairly hard to compare with that of my own, due to the varying method of computing onset timing relations with the metric grid. London and Polak choose to normalise all onset timings, countering the tempo difference across iterations, and continue by computing an average downbeat (as described above) from all the beginning onsets actualised around the central jembe figure cycle beginning point, which all other onsets then was kept relative to. This is contrary to the approach taken by this current study, as all onsets become relative to the beat span grid generated from the timeline pattern, without seeking to determine an average cycle beginning point from all instrument's pattern beginning onsets (which is also made problematic when some instruments don't have onsets at the cycle beginning point - in our context, the Esor's Adem bell). The approach taken by Polak and London et al. could be seen as actually fogging up the actualised messy timing relations held between the individual instruments, by creating an average cycle beginning point, hereby setting a moment in time which in fact doesn't actually apply to any one single instrument in particular, distancing the study from investigating any particular actors situatedness within the totality. This is an actor who in a very real sense is either behind or in front of the cycle beginning onset of any other ensemble instrumentalist. I argue this here and several times through this thesis that this situatedness matters and that this is why all patterns are held relative to the one being actualised by the Agye bell player.

More interesting for this current study are the thresholds found for standard timing variation relative to metric pulses, as these are easier to translate across studies. In the same study by Polak and London, they present a standard variation of onsets relative to subdivision classes - effectively corresponding to the grid points of the beat span grid - which amounts to 2,5-3,5% of the local downbeat duration. This averages out in their study as a standard onset/pulse grid-point variation of 7,5-10,5 ms for onset in music with a minimum downbeat durations around 300 ms and 15-21 ms for maximum downbeat durations of 600 ms. The way the SD's were computed, was by setting a 'timing window' for discriminating between which onsets where too far from the overall average metric cycle placement of the total number of onsets actualised at this particular position within the downbeat cycle. This window was around 17%, and was distributed unequally - -10% and +7 - behind and in front of the average onset timing position.

Translating these percentages into the Asafo context, this amounts to a standard deviation from the average onset placement between 11-15 ms for the Esor part. This result is rather small compared to the 19-28 ms SDs which is the case with the Esor patterns. Meanwhile, as we shall see in the end of this study, there is a suggested possible explanation for this rather large SD range, which might lie in how this large ensemble negotiate collective time.

Arriving at this conclusion, I choose to look past the immediate differences of London and Polak's studies - but keep them in mind. I firstly choose to look towards the relative 2,5-3.5% of downbeat duration as a

threshold for instrumental standard variation relative to their average timing position within the beat span grid, but set a bit higher to around 20 ms, as the standard deviation of all instruments relative to the RelTP-pattern beginning point are within the range of 19-21 in the Esor part.

Besides this, is I will occasionally skew to the relative "2% of downbeat duration" average grid-point timing asynchrony threshold, despite the way this threshold is being computed by Polak and London relative to a mean ensemble pulse position, and not an onset of the timeline instrument's cycle beginning point. This is mainly because the music is very much alike, in that they both involve timeline patterns and that both cultures (local tribes making up the population of Bamako Mali) have a talking drum practice. In terms of differences, this would most notably be that the Asafo ensemble is much bigger, and timing relations are thus also several more between 7 instrumentalist and dancers compared to Polak and London's 4 instrumentalists. Additionally, looking at the presentation of Polak's approach to recording musical examples (Polak 2010), all recordings were obtained outside, with unidirectional clip on microphones within studio-like circumstances, not involving any extramusical performance, which was a big part of the Asafo performance recorded for this thesis. Without claiming to much, I will make the conjecture that performance circumstances like those of the Asafo performance are not recordable without contact microphones, given that a great deal of singing, dancing and sound bleeding would make so much noise that unidirectional mics wouldn't be an option - leaving me to expect Polak and London's recording to have taken place in isolation from the general public and without extra musical involvement, which most likely have impacted the musical production process making up their body of timing data.

Inter-instrumental Asynchronicity Standard Variation Threshold

For inter-instrumental synchronicity conditions, there is no research looking specifically at percussion ensemble musics which also disclose specific ms-values for inter-instrumental timing synchronicity. Instead, the closest we come to a suggested threshold of inter-instrumental synchronicity is that of the often cited empirical study of synchronicity between instrumentalists in jazz music by Anders Friberg and Andreas Sundström (2002). This study showed timing discrepancies between a bass and the drummer's ride tap typically where around a 20 ms threshold, computed from timing data of studio recordings by bassists Ron Carter, Robert Leslie Hurst III, and Gary Peacock.

Setting: *Average Onset/Pulse Cycle* Asynchronicity and standard timing variation (SD):

- Esor - *Regular Onset/Pulse Cycle Asyncr. value;* 8-9 ms an *Onset/Pulse Cycle standard variation* of 20 ms

This means that an average asynchrony with a pulse cycle grid point above 8-9 ms in Esor and 11-12 indicates that instrumentalists are purposefully pushing away from this grid point towards another. All onset average asynchronies are taken relative to their nearest beat span grid point, while in theory, they are engendered by both, which is more visually displayed in nuance by the BeatSpanner's weight plots.

Setting: *Inter-instrumental IOI standard variation*

Furthermore, an average standard variation for *Inter-Instrumental IOI* is set to 20 ms, as described by earlier studies, with the same SD threshold of 20 ms as to the grid-point timing relations. This means that any inter-instrumental asynchrony above the 20 ms value, could indicate the instruments do not time their onsets relative to each other or - as we shall see - that instruments intentionally engage in creative play within beat spans.

Chapter 5 - Results

Tempo and Pulse Cycles Duration

I have chosen to use the 8- and 6-pulse cycle and not the 12- and 16-pulse cycles for the computation of Esor's beat span grid, as the average tempo of the Esor part is 140-150 bpm in a 2 count downbeat cycle. This would translate into a 16-pulse cycle with 51 ms (SD: 2,8 ms) and 12-pulse cycle 69 ms [SD: 5 ms] for the Esor. These are significantly below the 100 ms limit of sensory motor synchronisation suggested by (among others) Bruno Repp (2003), meaning that producing or conceiving separate strata of pulsation with less durational separation than 100 ms is highly difficult (excluding especially non-master drummer instrumentalists, which was the case of four performing instrumentalists in the recorded Asafo performance).

This means that the beat span grid-point durations for the Esor part is:

- 103 ms (SD = 6 ms) for the 8 cycle grid-points
- 138 ms (SD = 8 ms) for the 6 cycle grid-points

This also outstretches the following beat span liminal space durations. Arrows indicate the particular coloured beat span durations (in ms), which are the same in the second half of the two-downbeat cycle outline by the beat span plot beneath:

Results 1: Onset Relative to Beat Span Pulse Grid Timing Relations

In the following micro-timing analysis of the Esor part, the Agye bell timeline pattern will by default be the RelTP-pattern which informs the generation of the Beat Span grid plot. This determination was made because all instrumentalists recognise the Agye timeline's position as a metre-like governing pattern (as discussed in Chapter 1 and 3), which informs downbeat cycle, metric cycle terrain and tempo. Meanwhile, the hypothesis is that while the timeline pattern takes on a important role of governing ensemble tempo and informs about downbeat, it is the inter-instrumental timing relations between two players playing the two melo-rhythms going into the same resultant melody pair, which are the most dominant relations for keeping ensemble time.

This determination is also made because this analysis is one which insists on working from a point of situatedness within the process analysed. In other words; timing is always timing relative to a situated actor. In this context, that actor is the timeline pattern player, which is convenient as this person is also plating a central pattern to ensemble groove composition.

Beat Span Timing Comparison: Esor Part

Instruments and Instrument pairs

In the Esor part 5 out of 6 ensemble, instruments play repeating patterns all the way through (not counting the lead drum instrument as an ensemble instrument). These are the:

- Agye bell (Timeline Pattern)
- Adem bell (Intermingled Pattern),
- Ansarba (1. supporting drum),
- Ampah (2. supporting drum, played by the second supporting master drummer)
- Agyeyedo (1. supporting master drum and drummer).

The only instrument often varying its pattern excessively is that of the Amponsa (master bell).

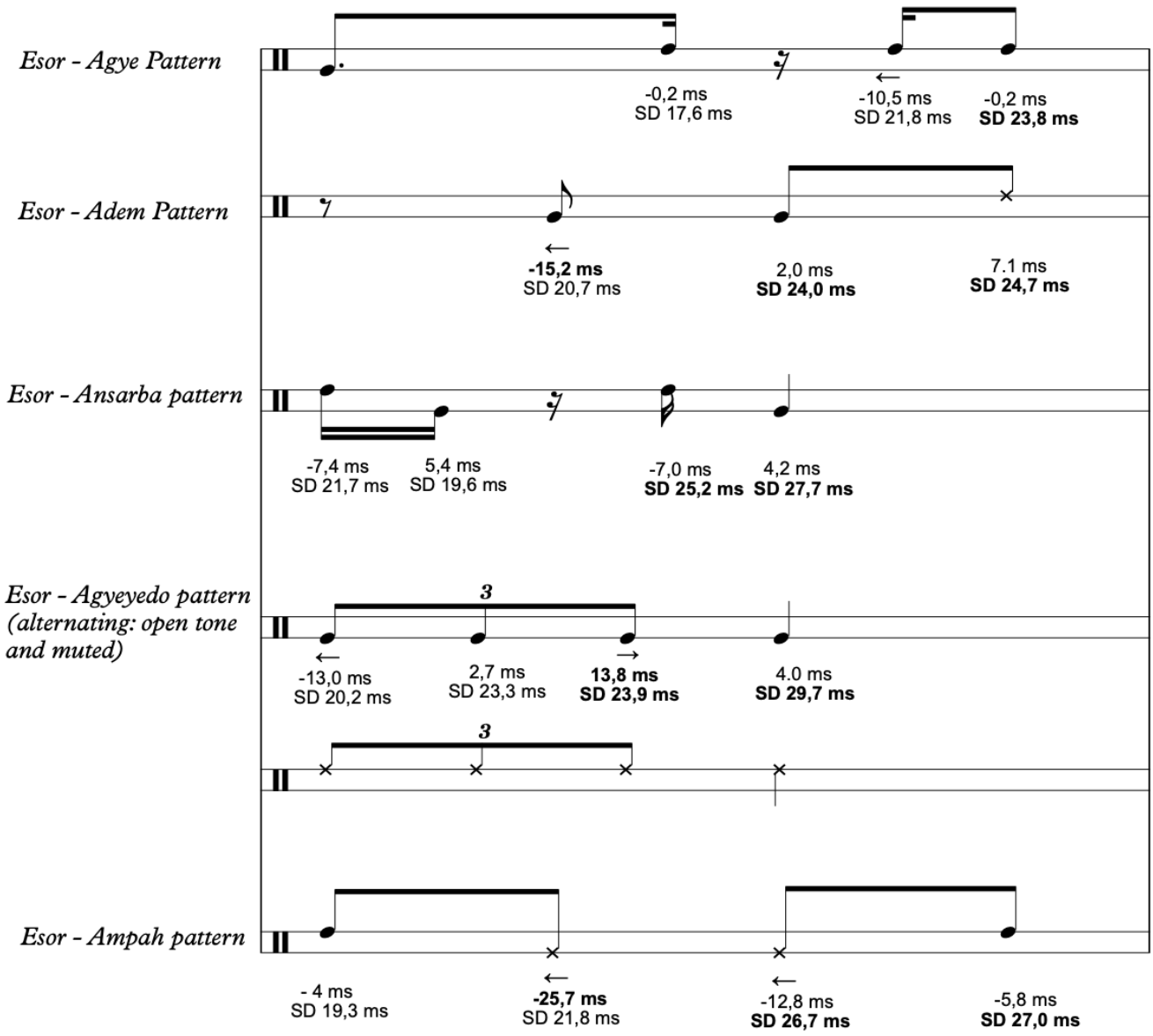
Looking into the Esor ensemble groove I will arrange this walk through in accordance with the pairs making up the groove.

The pairs are the:

- (1) Agye Bell and Adem bells
- (2) Ampah and Ansarba + Agyeyedo

Lastly I will look at the pseudo-improvised generative rhythmic playing of the Amponsa bell player, to compare the groove instrumental onset timing variations with that of the most common melo-rhythms picked by the master instrumentalist.

Beneath is listed all the Esor parts patterns and onset/pulse grid asynchronies and standard deviations together. Samples size's of groove patterns where 350-400. Meaning a total of 350-400 patterns where iterated by each instrument. This number was only impacted by each instrumentalists choosing to play a different number of pattern variations, which where omitted from the body of pattern samples. All patterns Onset/Pulse Cycle Asynchrony values are displayed together in **Transcr. 12** beneath;



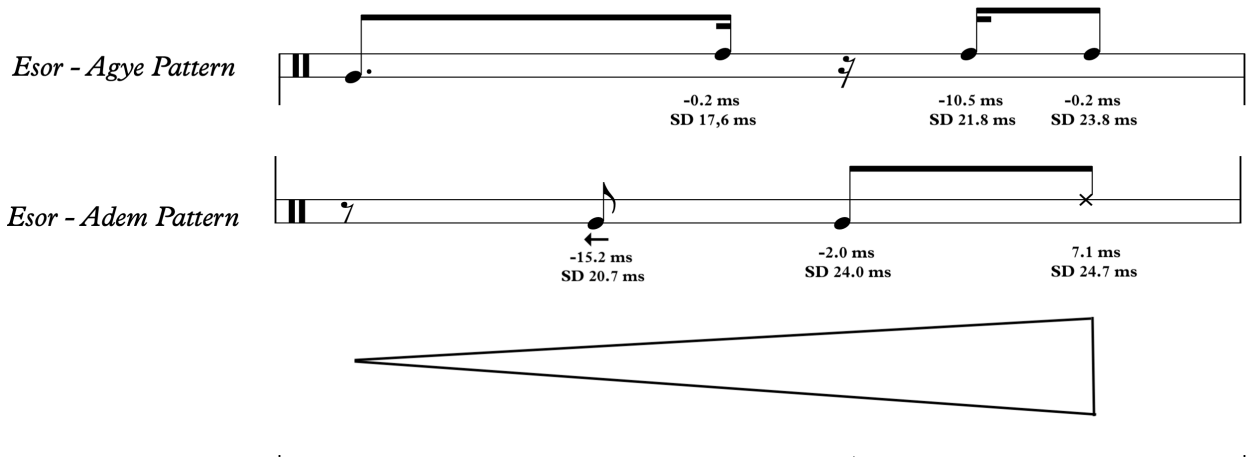
[Transcr. 12: Esor Part - Average Micro timing values and standard variation (SD) of ensemble groove pattern onsets relative to RTP-BeatSpan grid points]

First Esor Pair: Agye bell and Adem bell

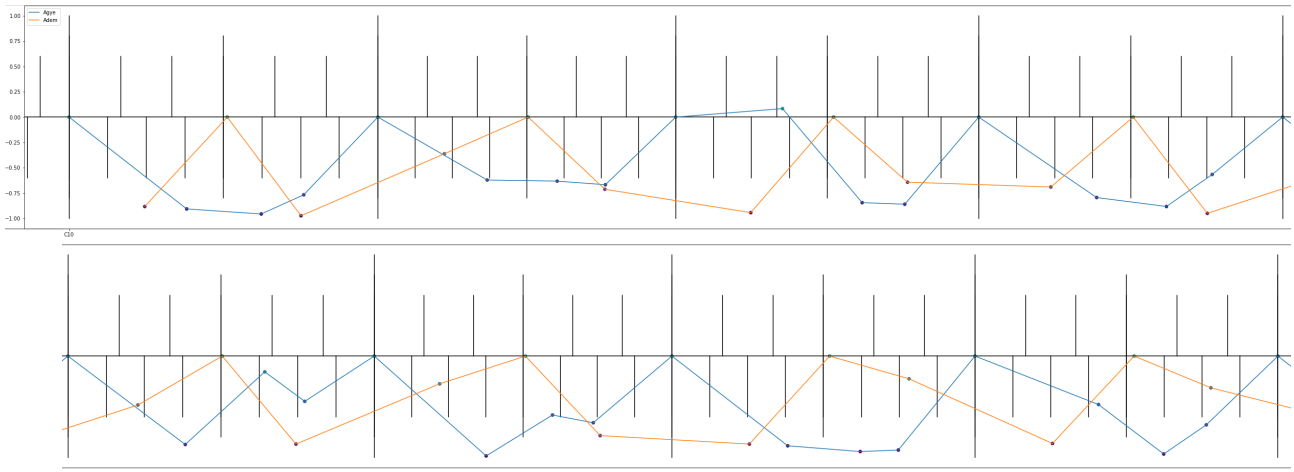
Together with the previously mentioned Agye Bell goes the Adem bell and produces their composite melody, by the Adem player *intermingling* with the Adje bell pattern, which actually starts with a relative poly-rhythmic dissonance and moves towards poly-rhythmic consonance as their patterns meet up at the 7/8 grid point (see **Transcr. 13** - listen to **Sound Example 5** in online appendix).

Below is the onset weight plot (**Plot 6**) showing the general weighting of the instruments onset side by side (blue lines connecting the Agye bell onsets and Orange lines connecting the Adem bell onsets), which fairly consistently both operate close to the 8-pulse cycle (close to y = -1 and blue dotted onset markings in the onset cycle weight plot). This stability seem to carry through the whole Esor part which can be seen in the Average Cycle Weight plot (**Plot 7**) beneath.

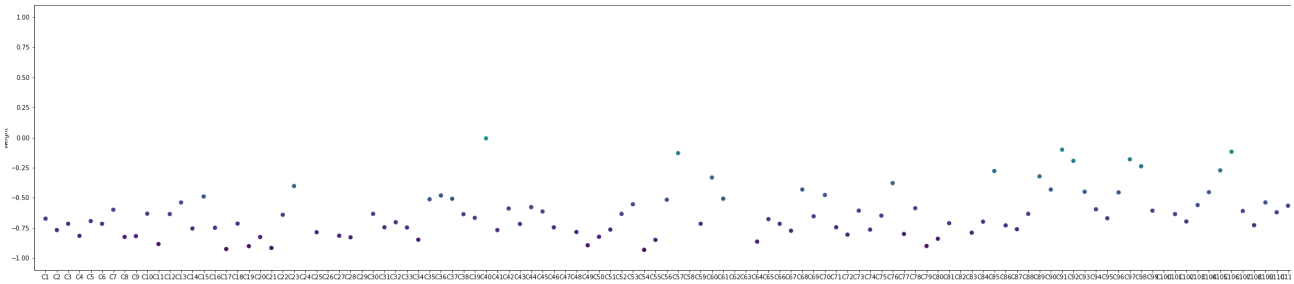
A significant asynchrony, which we will return to later, is that of the Adem's second onset which is on average pulled towards the 6-pulse cycle's 2/6 grid point, by 15.2 ms (SD: 20.7), which is more than 6 millisecond above the 'regular' onset/pulse grid asynchrony value set earlier (of 8-9 ms onset/pulse cycle asynchrony). Thus we might recognise recognise it as perhaps a deliberate "pulling away from", done by the Adem player. This average pulling away from, also seems to impact average cycle weighting of the Adem bell slightly, shown by marginally more yellow average cycle dots in the Avg. cycle weight plot (**Plot 8**)



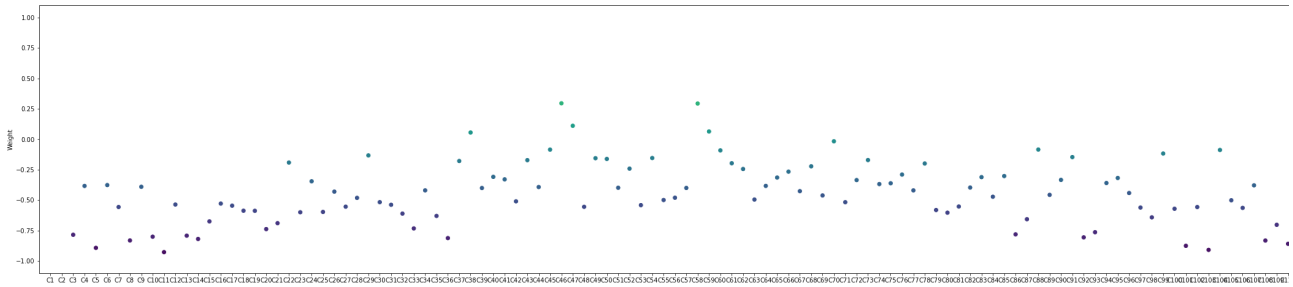
[Transcr.13: Agye and Adem poly-rhythmic syncopation wave]



[Plot 6: Onset Weight Plot - Agye (blue) and Adem Bell (orange)]



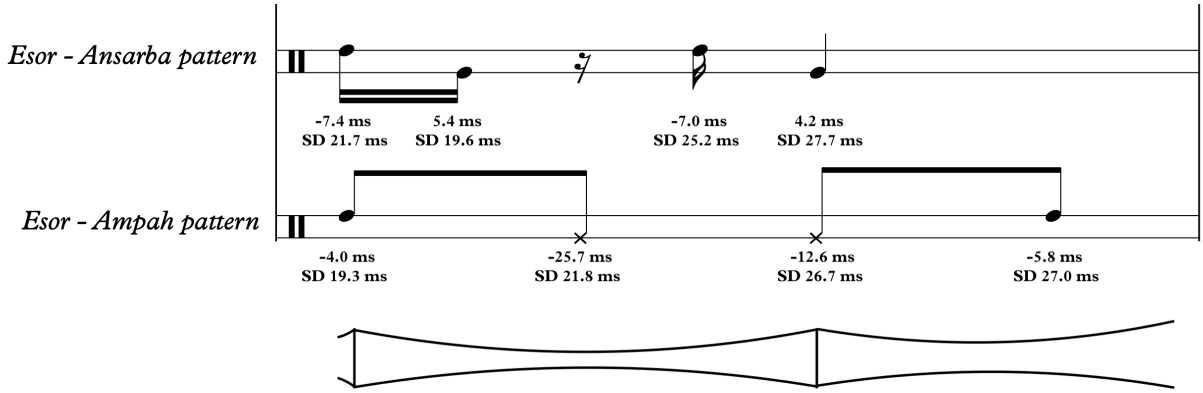
[Plot 7: Cycle Weight Plot - Agye Bell]



[Plot 8: Cycle Weight Plot - Adem Bell]

Second Esor pair: Ansarba and Ampah.

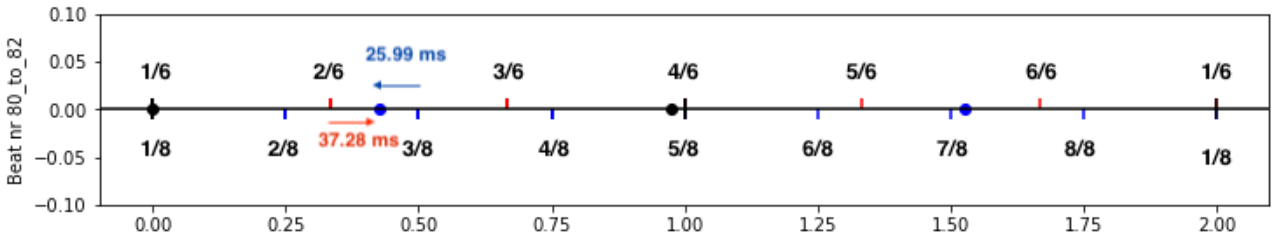
In the second resultant melody pair goes the Ansarba and the Ampah (**Transcr. 14**). Together they express a rather complex poly-rhythmic syncopation wave, meeting up at two points in the cycle.



[Transcr. 14: Ansarba and Ampah poly-rhythmic syncopation wave]

As shown in cycle plot (**Plot 9**) beneath, the Ampah on average phrases its onsets along the 8 cycle timeline, besides its second onset which is actualised on average -25.7 ms (SD: 21.8 ms) from the 3/8 grid point and quite close to the middle of the 2/6 to 3/8 beat span space - listen to the Ansarba and Ampah together in **Sound Example 6** in the online appendix.

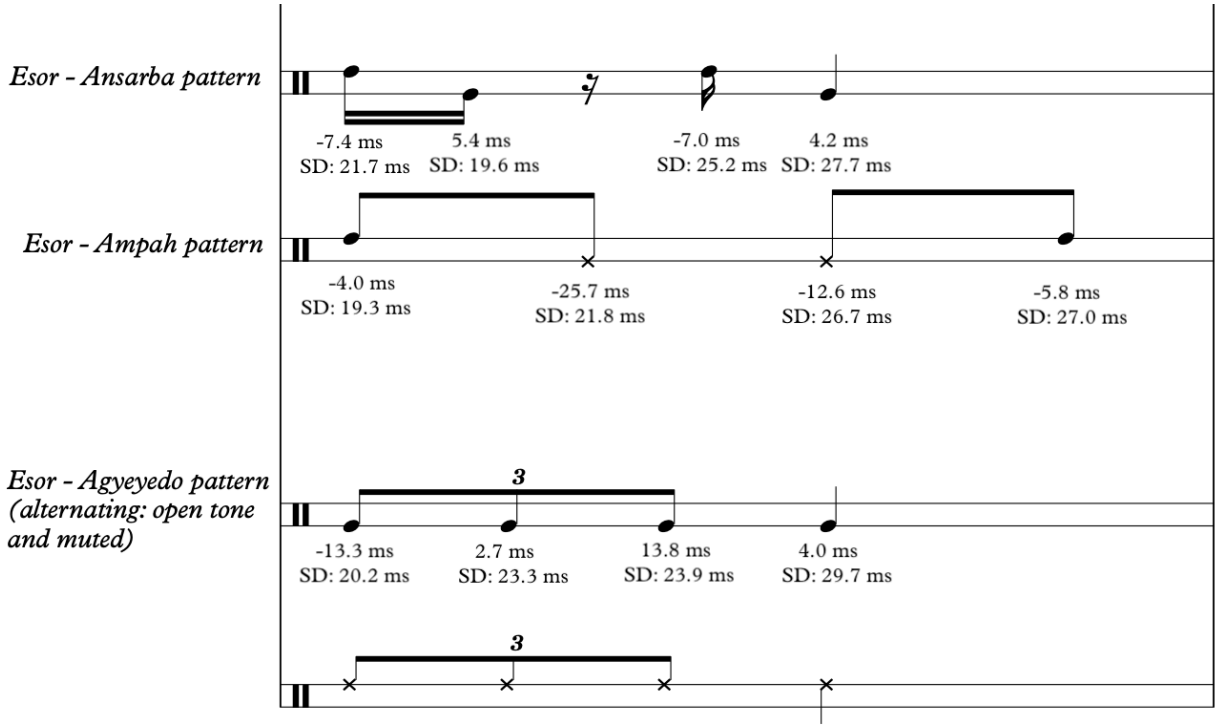
Curiously enough, this pulling is (somewhat) similar to that done with the earlier mentioned Adem bell's second onsets which is pulled on average 15.2 ms aways from this same point, leading one to suggest that this pulling is, to some degree, promoted by the Adem bell's onset timing at this moment in the cycle. Meanwhile, I do not have any statement form Takyi that tells me that there is any Adem and Ampah resultant melodic relation. Therefore, I will leave this as conjecture for now.



[**Plot. 9** : Esor - Ampah - Cycle Beat Plot]

Ansarba and Agyeyedo - Flexible Phrasing and Exploration of Beat Span Spaces

Additionally to the Ansarba and Ampah melody construct, is added to the earlier mentioned differently phrased version of the same prototypical rhythmic pattern as that played by the Ansarba. The three patterns can be seen notated together beneath (**Transcr. 15**).



[**Transcr**. 15: Ansarba and Ampah, with Agyeyedo beneath]

The Ansarba and Agyeyedo patterns provide us with a intriguing example of two rhythmic prototypically same patterns, but with differing melo-rhythm constructs and played by a different player. One is played with hands by the master drummer on the Agyeyedo drum, and the Ansarba is played by the second supporting drummer playing the Ansarba drum with sticks - both with their differing tone-colouring melody. (listen to **Sound Example 7** in online appendix).

Table xxx								
Ansarba	Stroke 1	Stroke 2				Stroke 3	Stroke 4	
BeatSpan - grid point	1/1	2/8				4/8	4/6 and 5/8	
Average (ms)	-7.4	5.4				-7.0	4.2	
SD (ms)	21.7	19.6				25.2	27.7	
Agyeyedo	**Stroke 1**		**Stroke 2**		**Stroke 3**		**Stroke 4**	
	1/1		2/6		3/6		4/6 and 5/8	
Average ms	-13.3		2.7		13.8		4.0	
SD ms	20.2		23.3		23.9		29.7	
	Stroke 1			**Stroke 2**			**Stroke 3**	**Stroke 4**
	1/1			3/8			4/6 and 5/8	7/8
Average ms	-4.0			-25.7			12.6	5.8
SD ms	19.3			21.8			26.7	27.0

Phrase Timing Difference of the Agyeyedo and Ansarba's second and third onsets:

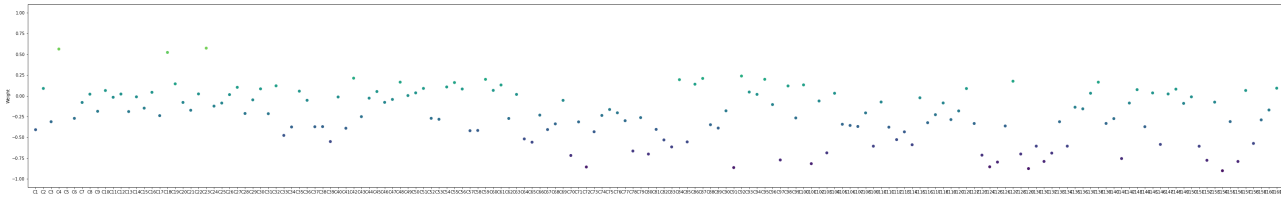
Firstly the results show that the Ansarba's second and third onset are on average actualised along the 8-pulse cycle - 2/8 and 4/8 grid point (Avg. Onset/pulse cycle asynchrony 5.4 ms and -7 ms and SD: 19.6 ms and 25.2ms respectively). Meanwhile, Agyeyedo's second and third onsets are on average actualised along 6-pulse cycle - 2/6 and 3/6 grid point (Avg. Onset/pulse-cycle asynchrony 2.7 ms and -13.8 ms and SD: 23.3 ms and 23.9 ms respectively). Additionally, the average Inter-Onset-Interval between the second onsets which is 29.8 ms (SD: 22.3 ms) and the third onsets which is 13.4 ms (with a SD: 21.1 ms).

These results of the Onset/pulse cycle asynchrony analysis goes to show that the Agyeyedo and Ansabar, while playing the same rhythm (while not same melo-rhythm) actualise their two middle onsets fairly differently - on average - and further more does so in a consistent manner repeating their micro temporal phrasing differences for the totality the Esor part, as they are both repeated along side each other all the way through.

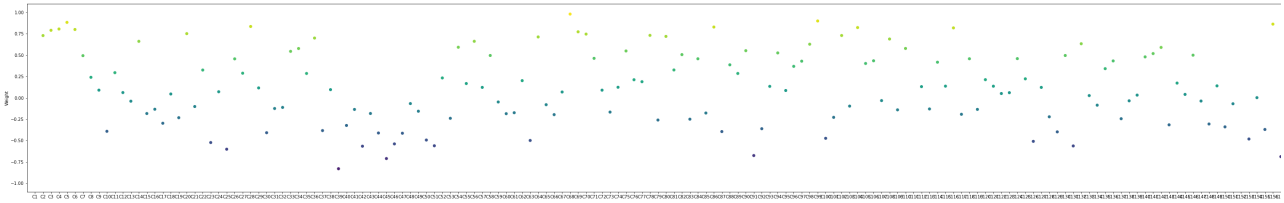
There is a slight difference to the third onsets of the two patterns as they have a avg. IOI between them of around 13.3 and with a SD of around 20.1 - which is not particularly high. Meanwhile, this also goes to comment on the Ansarba maybe pulling slightly towards the 6 pulse cycles at different moments, but this can not be said to be a consistent, if taking into account that the Ansarba third onset only has an avg. onset/pulse cycle asynchrony of -7 ms.

Meanwhile, turning to the Avg. cycle weight plots beneath (Plot 10 and 11), a definite average cycle weighting difference is clearly displayed as the avg. weight cycle dot's of the Agyeyedo and Ansarba are consistently distributed on each their own side of the y = 0 middle of the plot.

All of these results taken together leads me to suggest that the second master drummer (Agyeyedo) engage in deliberate and playful exploration of the beat span spaces adding some consistent playful creative micro rhythmic nuance or flavouring within the groove together with stretched second onset of the Ampah and the first onset of the Adem bell, which all pulled significantly towards the 6 pulse cycle out parameter of beat spans.



[Plot 10: Esor - Ansarba - Average cycle Weight Plot]



[Plot 11: Esor - Agyeyedo - Average cycle Weight Plot]

As to why these instruments don't seem to constantly clash against each other in flam like micro temporal asynchrony, this probably has to do with the two instruments' big difference in timbre and melo-rhythm melody. The Ansarba being a small high-pitch drum played with sticks, and the Agyeyedo being a larger deeper drum played with hands, that produces its sounds in a differing melodic structure relative to that of the Ansarba.

One very pertinent observation, which I will not comment on before towards the end of this analysis, is that there seems to be a trend of later onsets in a cycle displaying significantly larger Onset/pulse-cycle SDs compared to the earlier onsets. This is a trend which is similar to all the groove instruments, and

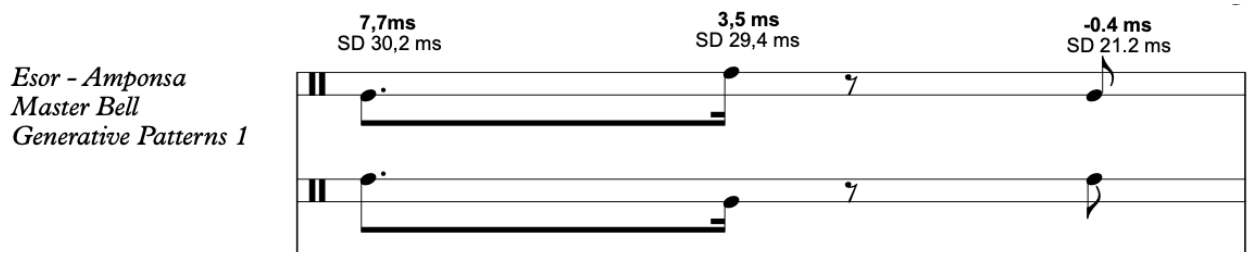
while this is a very significant trend, it will firstly be dealt with after having consulted the Inter-instrumental standard timing variation results.

Master Bell Patterns - Generative-Improvisatory Patterns:

Lastly we look at three Amponsa (Master bell) patterns. All three are improvisatory patterns which are made from a stock of generative rhythmic vocabulary which are put together in novel ways by master instrumentalists.

Amponsa Generative Pattern 1

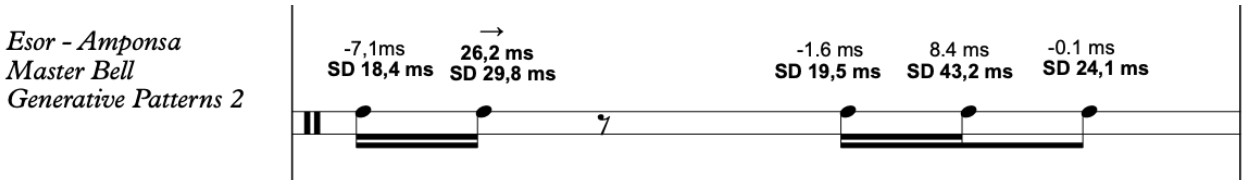
The first pattern has a three onset alternating melo-rhythm which is played for 130 cycles (dispersed among the 434 total RelTP-cycles - listen to **Sound Example 8** in online appendix), and is phrased along the 8-pulse cycle grid points with a SD of between 29-30 ms. This is high relative to the rest of the instruments. This indicates that the master bell player systematically pushes and pulls his two first onsets relative to the timeline RelTP-pattern, but given that the third onset at grid point 7/8 seems to have a 9-10 ms lower SD than the two others, this might indicate that this pattern has its poly-rhythmic moment of consonance at this point (this could be together with the Agye, Adem or Ampah, which all have onsets located at this point in the cycle).



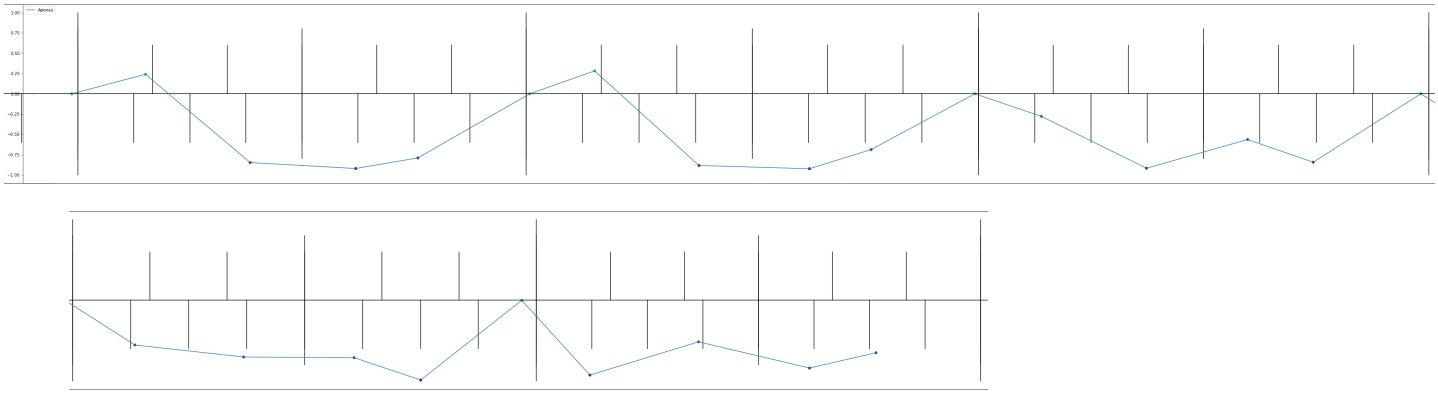
It might be suggested that when playing this pattern, the Amponsa player aims at hitting together with the fourth onset of the Agye timeline, which is actualised at this same position in the cycle (7/8 grid point), and has on average a similar Onset/pulse cycle asynchrony (0,2 ms) as the third onset of the Amponsa Pattern 1 (0,4 ms).

Amponsa Generative Pattern 2

The second pattern is a five onset generative melo-rhythm played for 34 cycles and works as an enticing and energetic high speed pattern, on only the high bell note (played on the bottom part of the bell - **Sound Example 9** - from in the online appendix).



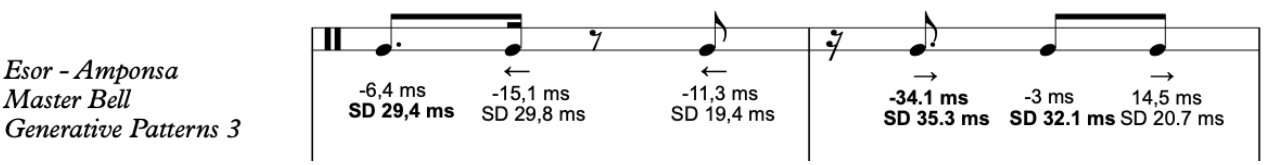
The second onset, and somewhat also the fourth onset, has a slightly early and late actualisation respectively and together they both have big SD's compared to their surrounding onsets, which again the onsets are actualised at significant position of inter-instrumental consonance with onsets of the other co-present groove instruments (onset two: SD 29.8 ms and onset four: SD 43.2 ms). Together this could be indicative of these two onsets being highly flexible and thus pulled towards the 6 cycle by the Amponsa at different moment in improvisational playing. This pulling of especially the second onset can be seen in the Onset Weight Plot beneath (**Plot 12**), which displays five pattern iterations where especially the second onset is pulled closer and closer towards the 8-pulse cycle across several iterations.



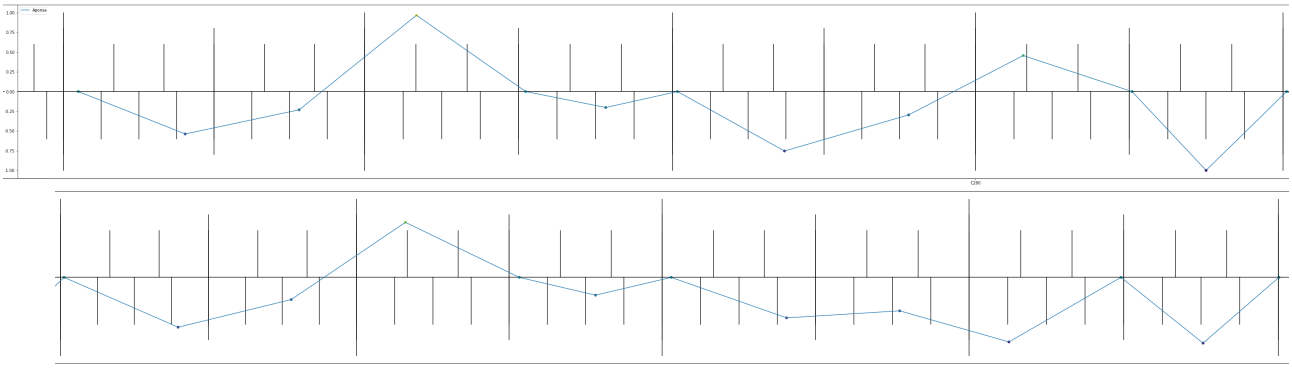
[Plot 12: Amponsa Generative Pattern 2 - Onset Weight Plot]

Amponsa Generative Pattern 3

The third generative pattern is a 6 onset double cycle melo-rhythm (played 24 x 2 cycles - **Sound Example 10**), which on average is phrased along side the 8 cycle, but at several places have such a large SD, so to indicate that these onsets are often pulled towards the 6 cycle (see onset weight plot beneath - **Plot 13**).



The only onset which is on average pulled towards the 6 cycle is the fourth onset at the 2/6 grid point (Avg. synchrony -10 ms). Both the fourth and the fifth onsets have large SD's, which suggests that their onsets are actualised significantly different, at different moments in the performance (fourth onset: SD 35 ms and fifth onset: SD 32 ms).



[Plot 13: Amponsa Generative Pattern 3 - Onset Weight Plot - NB: repeats every second RTP-cycle]

Summarising the Esor's Beat Span Micro Timing Analysis

Overall, several significant trends are shown by the Esor timing analysis above:

- Several instruments phrased their onsets consistently along points on both the 6 and 8 pulse cycle within even one iteration.
- Some, like the Ampah and Adem, even actualised their second onsets on average in-between to beat span grid points both with a fairly normal size Onset/ pulse cycle SD, seen in the light of the regular SD value of 20 ms set earlier.
- All patterns show an increase in SD values for onsets actualised later in the RTP-cycle - which is a trend we will return to in the coming section.
- Melodic pair patterns show same average beat span grid timings at moments of inter-instrumental syncopation consonance.
- Master drummer improvisation show several onsets with significantly high SD's, indicating that their melo-rhthmic patterns are more flexible in their phrasing relative to the ensemble groove patterns.

Results 2: Inter Instrumental IOI Results and comparison

For our second measure of timing relation, we look at the Inter-Instrumental onset timing of the Esor groove's resultant melodic pairs. This is a comparison of one melo-rhythm's onset-timing and timing

variability (SD) relative to their nearest onsets in the co-constituting melo-rhythmic pattern making up a given resultant melody instrument pair.

While we can't compare the IOI's of the inter-instrumental onsets, with the average asynchrony of onset and pulse cycle grid point, we can compare the standard variation of the average asynchrony onset/pulse cycle grid points with the standard variation of the Inter-instrumental resultant melodic pair IOI's. This is due to the standard variation (SD) being a measure for timing consistency, which is relatable across timing relational contexts.

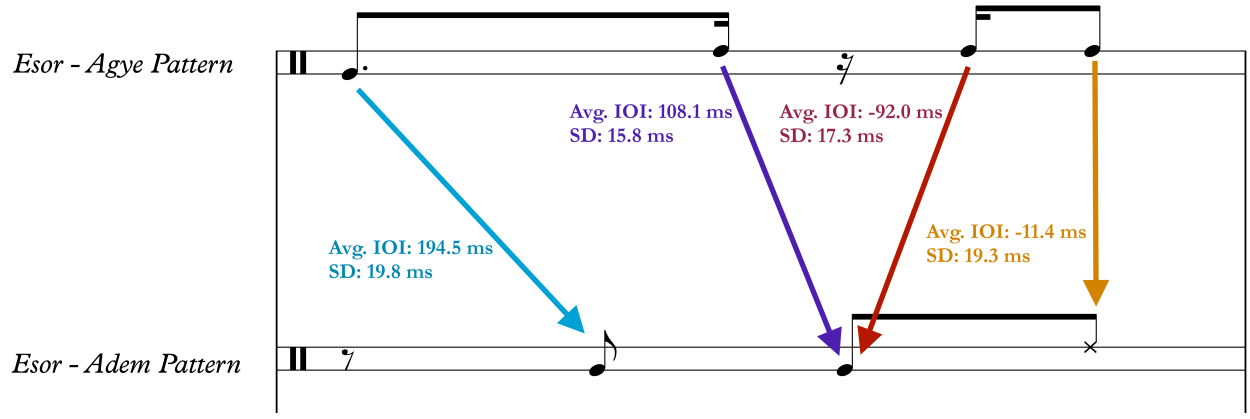
What this will give us is a measure of whether the instrumentalists phrase their patterns more closely with their resultant melodic paired instrument, or whether they more generally aim at timing their patterns precisely relative to specific points within the beat span space. If the case is that the patterns are individually more precisely timed relative to points within the RelTP- beat spans, then the SDs of the beat span analysis should be lower than the SDs of Inter-instrumental onset timings. To do this, all melodic pattern pairs had there individually closest consecutive IOIs calculated and an average IOI and Standard Variation calculated for all inter-instrumental onset pairs. Only ≈10 cycles from each body of 300-350 sample pairs where omitted do to being extreme outliers.

Beneath is the Esor pairs used for this comparison:

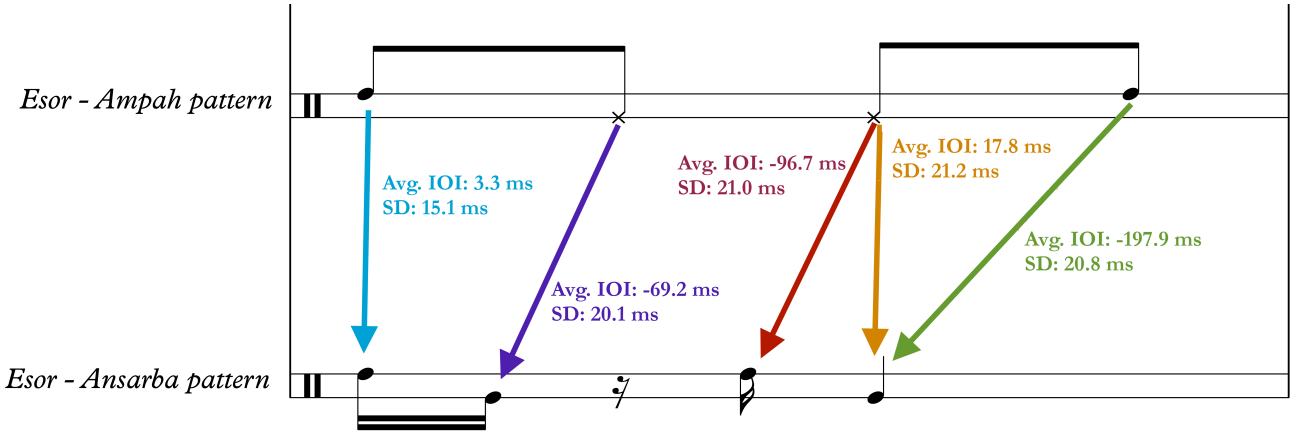
- Agye bell and Adem bell
- Ansarba and Ampah

Results of Melodic Pair Inter-instrumental IOI and Standard Variation

Results can be seen in Fig 16 and 17 beneath, which the two pairs and their relative IOI timing as well as all other individual SDs. Looking across all the results of the inter-instrumental onset computations, we see that nearly all IOIs exhibit SDs beneath or around the earlier mentioned 20 ms inter-instrumental asynchrony value, set by Friberg and Sundström (2002). Meanwhile, for us to get a greater sense of musicians' timing relationality, we need to look towards comparing these SDs with the SDs of the beat span analysis previously undertaken.



[Fig. 16: Agye and Adem inter-instrumental IOI and SDs]



[Fig. 17: Ansarba and Ampah inter-instrumental IOI and SDs]

Inter-instrumental and beat span standard timing variation comparison

For this comparison two set of tables (**Table 3.1 + 3.2 and 4.1 and 4.2**) are presented beneath, the first set listing the SDs value of the Adem and Agye, both of the Onset/pulse cycle analysis and those of the Inter-instrumental onset timing analysis from above.

Looking firstly at the Agye and Adem pair's Onset/pulse cycle grid point SDs, these ranges from 17,6 - 23,8 ms in the Agye pattern (which also is the RTP-pattern) and 20,7 - 24,7 ms in the Adem pattern. This, we might compare with the Inter-instrumental SDs which ranges from 15,2 - 19,7 ms which exhibit a fairly lower SD range mostly relative to the Adem, but surprisingly enough also that of the Agye. This gives a difference in SD range of 2,4 - 6,5 ms for the Agye and 5.5 - 10.5 ms.

This difference should further more be seen in the light of how the regular SDs for Onset/pulse grid standard deviation was artificially raised from the 11-15 ms (which where calculated from Polak and London's relative asynchrony value corresponding to 2.5-3.5% of local downbeat durations) up to 20 ms.

Meanwhile this trend is even stronger in the case of the Ansarba and Ampah pair where the Onset/pulse cycle grid point SDs range from 19,6-27,7 ms in the Ansarba and 19,3-27 ms in the Ampah, compared to their inter-instrumental IOI SD's which ranges from 15,2 ms to 21,7 ms. This amounts to a difference in SD range of 4,4 - 10,4 ms for the Ansarba and 4,1-9,4 ms. Overall, this means that all instruments (beside the Agye timeline) has Onset/pulse cycle SDs which are between 5,5 and 10,5 ms more than the inter-instrumental SDs.

Table 3.1: **Inter-Instrumental onset timing: Agye bell and Adem bell**

Agye and Adem	Adje 1 to Adem 1	Adje 2 to Adem 2	Adje 3 to Adem 2	Adje 4 to Adem 3
N 310	194.5	108.1	-92.0	11.4
	19.8	15.8	17.3	19.4

Table 3.2: **Beat span timing: Agye bell and Adem bell**

Agye/Agye grid	Onset 1	Onset 2	Onset 3	Onset 4
	1/8 and 1/6	4/8	6/8	7/8
Average ms	0.0	-0.2	-10.5	-0.2
SD ms	0.0	17.6	21.8	23.8
Adem/Agye grid		**Onset 1**	**Onset 2**	**Onset 3**
		3/8	4/6 and 5/8	7/8
Average ms		-15.2	2.0	7.1
SD ms		20.7	24.0	24.7

Table 4.1 **Inter-Instrumental onset timing: Ansarba and Ampah**

Ansarba and Ampah	Ampah 1 to Ansarba 1	Ampah 2 to Ansarba 2	Ampah 3 to Ansarba 3	Ampah 3 to Ansarba 4	Ampah 4 to Ansarba 4
N 372	-3.5	-69.0	-96.8	17.4	-197.9
	15.2	20.6	21.7	21.0	21.3

Table 4.2: **Beat span timing: Ansarba and Ampah**

Ansarba/Agye grid	Onset 1	Onset 2	Onset 3	Onset 4
	1/1	2/8	4/8	4/6 and 5/8
Average ms	-7.4	5.4	-7.0	4.2
SD ms	21.7	19.6	25.2	27.7
Ampah/Agye grid	Onset 1	Onset 2	Onset 3	Onset 4
	1/1	3/8	4/6 and 5/8	7/8
Average ms	-4.0	-25.7	-12.6	-5.8
SD ms	19.3	21.8	26.7	27.0

Ensemble groove time keeping - Ac and De-celeration Timing Wave, a Process of Keeping Time.

From the results presented above, we see that all inter-instrumental pairs with some significant precision keep their individual timing relations around the 20 ms value set for regular inter-instrumental synchronicity. Meanwhile, looking towards the standard variation of the ensemble instruments relative to the pulse cycle grid, there is a rather pervasive trend in the ensemble grooves of both Asafo parts which still haven't been addressed. This is the apparent increase in standard variation of the onsets actualised later in the RelTP-cycle, which show SDs range between 19,3 ms to 29,7 ms, which seem to be a relatively large increase in variability, going across the period of only one metric cycle (see **Table 5** beneath).

Table 5: SD of Esor Ensemble Instrumental

	1/8 and 1/6	2/8	2/6	3/8	3/6	4/8	4/6 and 5/8	6/8	5/6	7/8	6/6	8/8
Agye SD (ms)	0.0					17.6		21.8		23.8		
Adem SD (ms)				20.7			24.0			24.7		
Ansarba SD (ms)	21.7	19.6				25.2	27.7					
Agyeyedo SD (ms)	20.2		23.3		23.9		29.7					
Ampah SD (ms)	19.3			21.8			26.7			27.0		

This makes this researcher hypothesise that instrumentalists keep a collective timing, not by referring to any specific (metronomic) stable objective timekeeping concept, but by constantly engaging in a collectively negotiated movement of micro temporal increase or decrease of tempo, all through out a given performance context. This change generally happens on a cycle to cycle basis and is consistent for all patterns, which is indicated by the high SD's of later actualised onsets across all instruments.

The reason for the standard variation being largest to onsets actualised later in the RelTP-cycle is due to the acceleration or deceleration naturally not being actualised momentarily, but happening in a wave-like motion across a duration of time - in this context, happening across a RelTP-cycle - and because of this, changes related to tempo ac- or de-celeration are exerted more emphatically by later actualised onsets than earlier ones in the cycle, given that players need a span of time to unfold the micro temporal ac- and de-celeration change.

The rational for this type of time keeping would be that; due to timing always being in flux and timing relations being constantly relative and constantly reconstituted on a moment to moment basis, the way to take control in such complex situations is by acting according and treat it as "a process". By this, it is meant that collective timing is more easily kept by focussing on producing a collective unfolding movement rather than trying to establish an objective ideal akin to mechanic metronomic precision. What is precise in this context is the instrumentalist's collective temporal movement of relative ac- and de-celeration, from one cycle to another.

Testing the Timing Tempo Wave Hypothesis

To test this hypothesis, I go on to calculate the consecutive *changes* of all the original onset timings relative to the beat span grid point. The rational for doing this, is that for the SDs of all timings to be higher for onsets which are actualised later in the timeline cycle, this might mean that the later onsets exhibit larger onset/pulse cycle grid-point changes from iteration to iteration than earlier onsets, thus making the timing changes of later onsets larger than earlier ones if calculated sequentially. We did this to two different instruments; the Ase part's Agye timeline and the Adem (intermingled) bell.

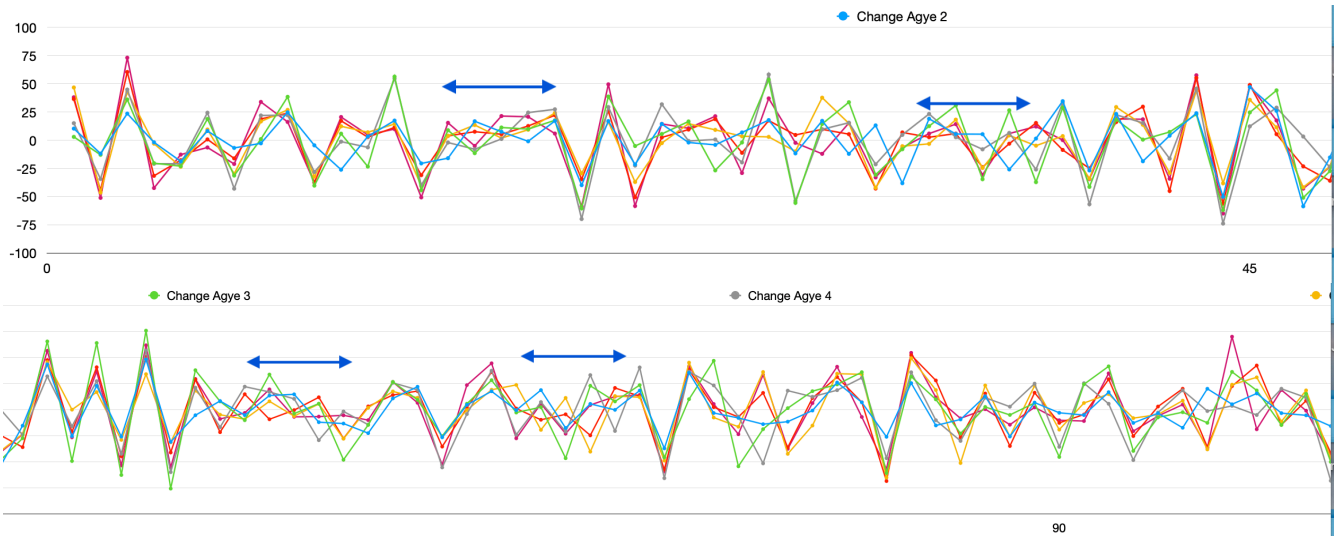
Computing the Agye and Adem bells' beat span timing *changes* is pretty straight forward, done by just subtracting the first cycle's onset timings relative to their closest pulse cycle grid point, from that of the same onset timing relative to the closest pulse cycle grid point in the next timeline cycle.

Table 6: Esor Part			
Agye onset/timeline grid timing changes	**Agye Stroke 2**	**Agye Stroke 3**	**Agye Stroke 4**
Avg. Change (ms)	0.0	-0.1	-0.0
Change SD (ms)	21.1	29.9	31.6
Adem onset/timeline grid timing changes	**Adem Stroke 2**	**Adem Stroke 3**	**Adem Stroke 4**
Avg. Change (ms)	0.0	0.1	0.0
Change SD (ms)	25.9	29.2	31.9

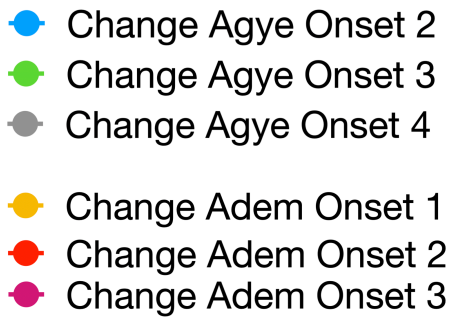
Results of this computation were positive towards the confirmation of the hypothesis, as there was found a fairly large increase of average *timing changes* between onsets 2 and 3 and onset 3 and 4 in both of the instruments (see **Table 6**). This amounts to an increase in 'Avg. Onset/pulse cycle grid point timing'-

change for +10.5 ms for the Agye and +6 ms for the Adem. Furthermore, it was found that the Adem bell's consecutive changes in relative timing were larger than that of the Agye bell's consecutive changes in relative timing.

For displaying these changes as they happen sequentially, a scatter plot was computed, which shows the relative change in individual onset timing from one iteration to the following (see outtakes from this large scatter plot in **Fig 18** beneath).



[Fig. 18: Onset/pulse cycle timing change]



From the scatter plot we can see how the changes of the individual onsets are simultaneous, while the changes of the later onsets in the cycle are consistently larger than that of earlier ones. In some cycles, these ac- and decelerations do deviate from each other, but for the most part, this is only for a short period of 2-5 iterations. The scatter plot also shows that when instruments do not follow a similar de- and acceleration alternation together, the alternating timing changes become significantly smaller than when they follow each other (these moments are marked by blue arrows in the scatter plot).

Interpreting Micro Temporal Process of Motional Timing Negotiation in Asafo Ensemble Groove

From the results shown above, it can be suggested that instrumentalist (consciously or unconsciously) keep a collective timing movement by systematically alternating between ac- and de-celerating of their pattern in unison. This strategy induces collective timing by asserting a wave-like micro temporal motion of ac- or de-celeration, keeping everybody moving together rather than aiming for one static micro temporal reference structure or point (like an external metronomic ideal) for all to synchronise with.

It is suggested here that this micro temporal accelerating and decelerating motion is acted out between musicians as a strategy for all to keep in time with each other, in other words keep a steady "changing" micro temporal movement with each other. While such a result has not - to my own knowledge - been found in earlier studies of west African ensemble groove, this might have to do with the circumstance in which these case recordings where made. In the current study nearly all regular participants where present for the performance (dancers, singers, instrumentalist, master drummers) - all besides the very important audience. This is contrary to studies like those of London and Polak, where it appears that their music is recorded away from the public and without dancers, singers or audiences present which, as already suggested earlier, might show to have a great deal of impact on the musical data gathered.

In this context it can be argued that the strategy of making the "target" one which is flexible and constantly negotiated, goes to mitigate the risk of any one particular actor becoming alienated from the process of groove performance, compared to a situation where the timing ideal is a mechanic external metronomic precise one. By making this wave like negotiated timing motion the ideal, it opens up the possibility for several semi-skilled actors be interject themselves into the process - like the young person picking up the Agye bell timeline for the first time.

This idea aligns very well with Hasty's process philosophical explication of meter as rhythm, wherein timing is a processual phenomenon, and meter is never an a prior stated pre-given metronomic container of periodicity wherein onsets are actualised. Instead, rhythm and meter is unfolding and negotiated together, and in the context of Asafo performance, inter-instrumental timing seem to be the most prevailing relation needed to be kept for a steady groove to be continuously produced. This, meanwhile, is done while musicians project an ac- and de-celeration movement into the future of the music processual unfolding creating a dynamic now-horizon which systematically expands and contracts, resulting in a collective movement for musicians to get "into" and together control as a collective now "present" separate from other outside of process (non-participating) realities and conditions.

Conclusion

What has been suggested in this thesis is that Asafo group musicians think of traditional ensemble patterns as having a fundamental connection to rhythm and melodic features of Fante speech. This connection has its crux within the speech drum practice kept by master drummers, which is a fundamental expressive mode of drum playing, which weaves together sentences of lexical meaning into complex textures of ensemble groove. This is done by master drummers "speaking" the important tonal melodies and rhythmic structures of normal speech through the head of drums, making them able to express complex spiritual, moral or ethical sentences and proverbs fitting within the context of specific social performance occasions (like the time cycle celebration during Oguaa Fetu Afahye festival).

Ensemble instrumentalist are taught their patterns through what Nketia and Arom call's a whole word method (maybe more astutely in this connection, a "whole sentence method". While many ensemble musicians don't explicitly know of their patterns as literal sentences, the patterns identity as "always firstly a speech drum construct", carries with it an inseparable melodic dimension, making them melo-rhythm like sentence structures in their own right which fit together in specific ways, when added into an ensemble groove process. The way patterns are composed to form a repeating performance groove is by coupling them into resultant melodic pairs, and these pairs become important for musicians to constantly keep a steady timing in relation to each other, as they don't turn to relate their patterns to a collective tapping of their feet or nodding of their head while playing these dens and complex textures. Instead the downbeat structure is delegated out into the feet of the participating (insider) dancers and audiences who pics this virtual downbeat strata from the governing timeline pattern and projects it onto the music by moving with it and embellishing it with simple clapping patterns. Participating audiences, dancers and instrumentalist interject themselves and their consciousness into the groove process by creating diverse and complex affective relations between their individual patterns, making up a field of situated participating actors creating the performance occasion.

This is what Nzewi calls a Melo-harmonic ethos, or a kind of *communitas* composition wherein all members of the Asafo community fills out a specific part of the performance process and experiences the totality from this particular situatedness, mode of participation and level of knowledge to do with the particular performance occasion.

Turning to the micro timing analysis presented in the second half of this thesis. Here three different micro temporal dynamics have been shown in the Esor ensemble groove, which also go to answer the two research questions posed earlier:

(1) *Do Asafo groove instruments flexibly pull rhythmic patterns into different metric realms simultaneously, as is described in literature about African and Afro-Diasporic traditional timeline music?*

- Ensemble musicians as well as master drummers show to be able to phrase their pattern in flexible ways, exploring beat span spaces by individually phrasing their patterns simultaneously along the 6- and 8-pulse cycle strata and sometimes in-between.

(2) *Do Asafo groove instrumentalists time their onsets more consistently relative to their instrumental pairs, or relative to the beat span grid?*

- Musicians show to time their onsets more consistently with each other than with pulses in the beat span.

Additionally it was found that:

- Musicians seem to negotiate tempo and keep ensemble timing by systematically de- and ac-celerating their pattern in a collective wave movement on a cycle to cycle basis.

These three results gained from the Esor part micro timing analysis goes to support a fundamental notion made by Keil's theory of participatory discrepancy, namely that micro-variation within groove is what can be considered the syntax governing the rhythmic patterns as dancing particles (Stover forthcomming). The way these groove element can be understood as acting like "dancing particle" is through:

- The co-constituting melo-rhythmic affective relations central and all important for the notion of 'right musical timing' to arise for any master drummer or fellow musicians.
- The prevalent flexible movement together of instrumentalists between de- and ac-celleration
- The systematic pulling of onsets and pattern phrasings toward opposite moments within beat span near-simultaneity

From the results presented above it is suggested that the Asafo percussion ensemble operates within a collective now-horizon which constantly is negotiated by performers ac- and de-celerating their patterns alternately together. Within this now-horizon, patterns are not timed most precisely in relations to some distinct moment in a virtual beat span grid but more consistently in relation to the pattern which they fit together with as melodic pairs, which then again goes together into expressing a larger melo-harmonic

ethos. From this inter-instrumental matrix of melo-rhythmic patterns, a field of beat span spaces are stretched out and is creatively and flexibly explored by e.g. the Agyeyedo supporting master drummer (and suggestively by the Ampah and Adem patterns), as he consistently phrases his groove pattern to the opposite side of the beat span liminal spaces relative to that of the Ansarba, perhaps contributing to the pervasive sensation of "dynamic tension" described by Chernoff (1979) in his work on similar traditional percussion practices in the Ghanian Ewe tribe. This micro-rhythmic flexibility and inter-instrumental groove dynamic is most likely what is also referred to as "playing in *fix*" by Micheal Spiro (2006) as he reports how right pattern timing/phrasing in timeline musics often is only known from experiencing ones own pattern in relations to another sounding one. This is also supported by the accounts given by Chernoff's master drummer interlocutors, who reports that they actually only know how to improvise with their own instruments if they have one or more sounding pattern which they are able to 'response rhythmically to'.

While in this current study, only a single (yet lengthy 7 min) performance part was computationally mapped and analysed, these results naturally needs to be supported by additional analysis of similar musical material in the future. In my own future work, I plan to expand this same approach into analysing the Ase part, which was left out of this thesis, as it presented some further complicated conditions. This was e.g. that the Ase part is in a tempo (110 bpm) where the 6-pulse cycle in theory actually could be turned into a 12-cycle pulse strata (with pulses only 93 ms apart), stretching out beat span liminal space between a superimposed 8- and 12-pulse strata. This, meanwhile, presents us with several new theoretical complications about whether such a beat span grid is possible and how exactly to determine when a beat span pulse strata is to dense for musicians to psycho-motorically operate within. Finally a more in-depth analysis of the connection between speech drum and melo-rhythmic constructs is needed, as only very little specific insight is written down and available in academic literature. Meanwhile that which is, is only very specific in nature, and thus doesn't comment on larger similarities across of multiple ethnic group's use of speech drum in ensemble composition practices.

Finally, to the question of what could describe the sensation of right timing, Takyi comes up with an analogy using the viscosity of "Gel" to describe how the instrumentalist sounds right together in his mind:

[02.11.11]

Takyi: "We help each other when we are playing, we help each other when one is going off. Because we don't stop and say one, two, three…. We keep on playing, but the master drummer, who is the controller, will try to bring as all together to a point [weaving his fingers together], so we blend and gel well."

Researcher " what do you mean by gel?"

Takyi "I don't know how to explain it. Like jelle [Jello]"

Researcher "Like smooth?"

Takyi “Yes, smooth!… Something like that.”

(cit. transcription in online appendix)

Taking this choice of words to bear, it points very much towards a more soft and flexible nature described by Stover’s non-grounded determination of groove interaction. Where a pattern is related to its position in beat span or as part of a melodic rhythmic pair patterns are never something which are becoming engendered “against” one another but much more something which is engendered “with” each other.

To “gel”, as a flexible viscose sensation perhaps could be understood as pressing the same dynamic as Acquah’s ‘sounding clearly together’ (2018). Most pertinent of all to me and Takyi’s conversations is that there is a emphatic distancing done by Takyi from relating any rhythmic timing to any metric syntax having to do with counting. Instead, as shown by the results above, right timing seem to fundamentally be something which is constituted by multiple moving and responding bodies constantly asserting themselves into the process of a communal performance composition expressing a strong and visceral melo-harmonic ethos and depending on all participating actors taking on the mental posture expressed by the term *Ndoboa* - “to lean on each other”.

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Appendix:

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