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The Art of Remixing in Abidjan (Ivory Coast)

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ABSTRACT

In the cosmopolitan city of Abidjan, various music traditions from Western Africa and beyond meet and hybridize with globalized black music genres such as reggae and hip hop. Based on ethnographic data collected in local recording studios, we describe the career of five studio professionals, namely Tupaï, Patché, Gabe Gooding, Charlie Kamikaze, and Lyle Nak; and we report on the workflow and digital signal processing events of three recording sessions. Our analyses reveal that the creative processes of Ivorian studio professionals are centered on remaking or remixing instrumentals that they retrieve from the web or from their past productions. We conclude with our plans for future collaborations with these practitioners and the female network *Les Femmes Sont…*founded by Lyle Nak.

1 Introduction

The musical reputation of Abidjan goes back to *JBZ Studio*, which was directed by French-Ivorian producer Jacques Bizollon from 1981 to 2018. It was in this mythic studio, independent from major labels, that internationally-renowned reggae artist Alpha Blondy developed his career, as did the world music stars Pat Thomas from Ghana and Les Ambassadeurs with Salif Keita from Mali. In the 1980s and 1990s, musicians came from all the sub-region to record at *JBZ* and two other local studios, namely *Nefertiti* and *Sequence*. [1] The business of these studios declined through the 2000s with the Ivorian political crisis and unsustainable competition caused by the fast multiplication of small-scale studios based on digital audio workstations. We refer to these as *DAW studios*. [2]

Whereas the transition from recording live ensemble performances in large-scale analog studios to programming MIDI instrumentals and editing vocals in DAW studios has generated new digital traditions of music-making worldwide, [3] the diversity of Abidjan's studio culture remains unique in its ever-evolving multiculturality, which is grounded in a rich local heritage. In this paper, we highlight specificities of this culture by examining the careers and workflows of local DAW practitioners who produce various genres and who represent a range of nationalities, generations, and genders. We also compare our findings with the DAW practices that we observed in Bamako (Mali), [2][4] another musically influential city of the sub-region.

This study takes place in an international research and education partnership that aims at renewing the discourse around innovation in Western African societies, while contributing solutions to enhance Western African studio professionals' access to higher audio education and to the international audio network. [2] Our methods follow an ethnographic approach, combining interviews with the filming and event-based indexing of recording sessions. [4]

In the following sections, we explain how we co-create the advancement of the research with Western African sound engineers, music producers, arrangers, beatmakers, and performers, and how we involve local and international educators, students, and institutions in partnership activities.

2 An ethnographic approach

In March 2020, Olivier carried out her first fieldwork residency in Ivory Coast during the Abidjan Market for Performing Arts (MASA) that featured more than 200 shows of African contemporary creation [1]. Thanks to the network of Éliézer Oubda from Ouagadougou (Burkina Faso), [2] who was directing the sound booth of the Mande stage at the MASA, she quickly met with local sound engineers who have played an important role in establishing the *Ivorian sound*. These include the beatmaker Tupaï (Figure 1) and Adolphe Yacé, former head of the National Superior Institute for the Arts and Cultural Action (INSACC), renowned as a performer and arranger with his late brothers Marcellin and Évariste. In the 1990s, the *Yacé Brothers' Studio* was one of the first in Abidjan to switch from analog recording to MIDI programming, [1] thus opening the door for the local development of digital production processes.

During her first fieldwork, Olivier also worked with PhD student Mahesse Stéphanie Kolé [5] and a young arranger named Fatoma Diarra, who both introduced her to more DAW practitioners, including Patché (Figure 2) and younger ones such as Gabe Gooding (Figure 3) and Charlie Kamikaze (Figure 4). Following the three initial network threads facilitated by Oubda, Kolé, and Diarra, Olivier got in touch with more DAW practitioners when she came back to Abidjan in July 2021. Moreover, through Kolé she met Lyle Nak (Figure 5) who is, so far, the only female studio professional that she and Pras have met across their respective fieldwork in Abidjan, Bamako, Dakar (Senegal), and Ouagadougou.

In July 2022, Pras joined Olivier to contribute her audio engineering expertise to the data collection, and so to expand their collaborative study on the creative uses of digital audio technologies in Western African DAW studios that had started in Bamako in July 2018 [2][4]. Their fieldwork also focused on strengthening connections across Western African audio communities, and on identifying existing programs and needs for advanced professional audio training, especially for young feminine-identifying musicians who had started engaging in DAW production.

Figure 1. Tupaï at Victory B Studio in July 2022

3 Profiles of local DAW practitioners

3.1 Beatmaker/producer Tupaï

Patrick Arnaud Koffi, also known as Tupaï N'Gouin Claih, grew up in Cocody, a comfortable neighborhood in Abidjan, with a Caribbean lawyer father and a mother who was the first woman magistrate in Ivory Coast. Many members of his family were involved in music and sound, and so early on he discovered European classical, Afro-Cuban, and pre-independence Ivorian musics, as well as the national orchestras of Mali and Guinea. He also discovered funk, reggae, disco, and French *variété* thanks to his uncle who travelled abroad. Meanwhile, he got into audio technologies by taking apart and reassembling radio receivers.

In the early 1990s, Tupaï became interested in DJ practices and American rap. Self-taught in music, he started the rap band Main Frame in 1992 with his brother and a friend. They recorded a few tracks that quickly received the attention of renowned Ivorian producer François Konian, who was a close friend of his uncle and who proposed taking the young band to the USA to record an album with Stevie Wonder. However, Tupaï's parents prevented him and his brother from pursuing a career in music. They sent him to Dakar to finish high school in 1996-1997, and then to France to study law and insurance.

In 1999, Tupaï started composing, beatmaking, and arranging tracks in his home studio in France with Ivorian musicians who gave him access to digital audio technologies. He learnt his skills from his peers, as well as from specialised magazines such as Audio Fanzine; from information available on the web; and from attending a computer music workshop organised by the Information Center and Resources for Popular Music (IRMA) in Paris in 2000.

In addition to recording musicians from the Ivorian diaspora, Tupaï worked with French jazz, pop, hip hop, zouk, and reggae musicians. He also collaborated with emerging artists of his generation including Booba. Following the death of his father in 2013, he came back to Abidjan where he first worked in *Side Studio*, owned by Issa Ghandour. In 2014, he opened his *Victory B Studio* in Cocody. Nowadays, he primarily creates beats, arranges, and mixes tracks for trap and drill artists locally, in France, in the UK and in the USA. He also produces tracks for religious and Mande artists, as well as commercial and TV show jingles. He recently started Street Corner Live, a series of spontaneous street shows, and he regularly raps and sings on hip hop and reggae albums, which led him to be nominated for the local Victories of Reggae in 2019.

3.2 Arranger/engineer Patché [1]

Doyoh Theodore Cyriaque Dje, also known as Patché, was born into a family of musicians in the San Pedro coastal area. Trained as a percussionist and a singer, he grew up in Treichville, a district of Abidjan where most of the clubs, live venues, and recording studios were concentrated in the 1970s and 1980s. While his father listened to French *variété* singers, he preferred reggae, RnB, gospel, and New Jack, a fusion genre also referred to as swingbeat.

In 1997, he formed the RnB band Nexane with his brother. A year later, he attended a program funded by a non-profit French organization that enabled him to learn how to produce fusion musics with Burkinabe and French musicians. This gave him the opportunity to perform in Burkina Faso, France, and Germany, where he discovered punk and metal, genres that were not popular in Ivory Coast.

Figure 2. Patché at Matrix Studio in July 2021

In the early 2000s, he was mentored as an arranger and sound engineer at Studio Project, one of Abidjan's major recording studios at the time, owned by Gustave Oulahi, also known as Tonton Momo. There, he worked with the famous Ivorian rap band R.A.S, and became one of the main composers and arrangers of Gbonhi Yo-Yo-Yo, created by Ivorian singer Nash. He performed with them in many Western African and European festivals, which led him to record tracks with the Ivorian diaspora in the Paris suburbs.

In 2012, Patché opened his *Matrix* studio to record a range of Western African genres, including Ivorian zouglou, Mande, and Congolese musicians, and Ivorian and French rappers. He then dove into *coupé-décalé*, an Ivorian clubbing genre that has become highly popular in the past 20 years thanks to DJ Arafat. He established his reputation by working with renowned *coupé-décalé* singers such as DJ Alan. He was nominated in 2018 for the International Prize for Urban Music and Coupé Decalé (PRIMUD) Awards.

3.3 Sound engineer Gabe Gooding [1]

Gabriel Adié, also known as Gabe Gooding, holds multiple nationalities. He grew up in Lagos (Nigeria) and then in Accra (Ghana). His half-Nigerian and half-Ghanaian father worked in the military but practiced DJing as a hobby and was a fan of Fela Kuti's Afrobeat. Gabe followed him to Abidjan in 2009. However, in 2010, he moved to Lomé in Togo with his Beninese mother to avoid the Ivorian political crisis. Back in Abidjan in 2012, he completed a degree in computer sciences. Meanwhile, he started playing the piano at the Evangelist church of his district, which introduced him to Western music harmony.

Gabe's first studio experiences date back to when he was 17, when he attended recording sessions in a studio in Accra and learnt mixing tips from online tutorials. His sound engineering interests became a profession following his graduation when he was hired by two audiovisual companies in Abidjan to produce TV and commercial soundtracks. Meanwhile, he started mixing tracks from established arrangers like Patché. In 2021, Universal hired him to record Ivorian, Malian, and Congolese singers signed on the major label.

During a dinner at Maison Sopi in Cocody in July 2022, Gabe described to us his mixing and mastering methods with details that revealed his passion for the technical side of production. These details demonstrated that he is fully in control of his tools, and that he can efficiently mix all sorts of tracks in a timely manner and with care. He also had questions for us that conveyed his curiosity and enthusiasm for learning new techniques.

Figure 3. Gabe Gooding at Matrix Studio in March 2020

3.4 Arranger/engineer Charlie Kamikaze

Charles Kouadio, also known as Charlie Kamikaze, comes from a family of musicians. His father owned a recording studio in Dimbokro, South-Central Ivory Coast. His uncle was the singer Nst Cophie, who had a successful local career in the 1980s and 1990s before moving to France and the USA. Despite this, Charlie learnt how to play the piano alone in 2009-2010 when he was studying medicine.

When university classes were disrupted for two years due to the political crisis, Charlie left Abidjan and moved to Didiévi, a small town between Yamoussoukro and Bouaké, where a cousin introduced him to FL Studio. He then spent number of nights watching YouTube tutorials to learn enough skills to open a DAW studio in a computer store. Here, he started producing local genres such as *baoulé* (traditional vocal polyphonies) and *coupé-décalé*.

Charlie came back to Abidjan in 2012, quitting his medical studies to start a bachelor's degree in musicology. At the same time, he worked as an arranger and learnt how to mix at *Riche Studio* in the popular district of Yopougon. In 2014, he built his own studio with a friend based on some equipment that he bought from a beatmaker, and which he completed with new devices. He took paid online mixing and mastering classes to learn how to meet professional standards and to develop his own sound. He describes his sound as "powerful without deterioration", implying that he uses a lot of dynamic compression and limiting but knows where to stop.

In 2016, Charlie switched from producing *coupé décalé* to focussing on rap, Afrobeat, and Evangelist music. He regularly works with foreign artists. In parallel to his studio business, he also sells used vehicles.

For Charlie, the mix has its roots in the composition. To prepare for the mix, he balances the different sources while he is programming the instrumental. He explained to Olivier his technique of *remaking*, which consists of listening to tracks from Ivory Coast and elsewhere in Africa on the streaming platform Deezer, and then reproducing the sound of the tracks that have received most attention. This technique enables him to understand how tracks are composed and to find ways to adjust plugins to achieve a specific sonic result.

Figure 4. Charlie Kamikaze in his studio in July 2022

3.5 Arranger/engineer & drummer Lyle Nak

Liliane Nakobo, also known as Lyle Nak, got involved in music in her teens by playing gospel music on the keyboard in an Evangelist church at Yamoussoukro, Central Ivory Coast. When she moved to Mermoz City, the musician and student neighborhood of Abidjan, she followed drummers in night clubs to familiarize herself with this instrument that women are not allowed to play in a religious context. She became a drummer for a female *research music* band that combines local rhythms with chords from other genres including jazz. Whilst studying for her bachelor's degree in management, she subbed for drummers in number of bands. She was recently nominated as the African ambassador for the *Hit Like a Girl* contest.

Lyle was introduced to audio engineering by a live engineer who she met during a concert in 2017 and who would become her mentor. She was then hired by Frames, an audiovisual production company for which she composes, arranges, writes lyrics, and works as a *top liner*, which involves writing vocal melodies over existing instrumentals for commercial and TV soundtracks. She is now pursuing her audio training through online courses available on udemy.com, as she wants her learning to go beyond DIY skills.

Since 2021, Lyle has been sharing her knowledge with women. Following a computer music workshop that she organized for eight women musicians at the French Institute in March 2021, she created a WhatsApp group to keep up with them. In 2022, she mentored a female percussionist who was finishing her bachelor's degree in music at INSAAC. Her current network Les Femmes Sont… (a play on words that draws together 'women are' and 'women in sound' in French) counts about 15 female instrumentalists who want to record and mix their own music, work as beatmakers, or work as tracking, mixing, mastering, or live engineers.

Lyle regrets that what she refers to as 'research music' has not found a large audience in Ivory Coast. People prefer urban genres such as *coupé décalé* and trap. Traditional rhythms do not sell. Nevertheless, she is developing a sample library that combines local and international rhythmic gestures in MIDI, with excerpts of live drum recordings from a range of past projects. She told us that she regularly exchanges samples with other beatmakers, and that she uses them as a basis for recording vocals before creating new instrumentals.

Figure 5. Lyle Nake at Frames Production in July 2022

4 Filming local recording sessions

Witnessing the intimate process of collective music-making in recording sessions remains a privilege and filming this process comes with its challenges. [6][7] Ethnographers must take precautions to avoid disrupting the creative flow of the production process. Accordingly, we build trust by establishing relationships with the studio practitioners through meetings and interviews before we ask them whether we can film a session that involves their client(s). Additionally, at the beginning of the session, we take the time to explain to the client(s) who we are and what the objectives of our partnership are. Only after everyone gives their oral consent do we set up our equipment.

We film the sessions with two cameras: one to capture the human interactions and performances which is usually used by Olivier, and one that focuses on the computer screen and the DAW practitioners' actions, which is controlled by Pras when she is present. To reproduce the sound of the production process as it was heard in the cabin, we systematically record the entire recording session with a ribbon Royer SF12 placed behind the head of the DAW practitioner. This stereo microphone was chosen because it has a flat frequency response until a roll-off in the high-end and because of its dynamic transmission. These features are specific to ribbon microphones and perceived to be close to human hearing. Further, the fact that it does not require phantom power conserves the batteries of our Tascam DR-100 recorder, which makes it more convenient than using microphones that need alimentation when recording continuously for long hours in small spaces that often feature limited options for charging.

During the July 2022 fieldwork, we complemented the stereo perspective of the cabin sound provided by the SF12 with the recording of the DAW's main stereo output on a SoundDevices MixPre-6. This allows us to conduct MIR audio signal analyses with research collaborators on the partnership in the future. [7] However, this addition was at the expense of not collecting screen captures, as we had done for our ethnography of Bamako recording studios [2][4] because of the time that setting these things up requires at the beginning of a session. Aware that clients are paying for their session and that troubleshooting our capture systems could negatively impact their perception of the studio practitioner's technical expertise, we must let go of the setup of these intrusive systems as soon as we feel that there is a danger of disruption.

So far, we could collect three complete sessions, one by Olivier alone in July 2021 and two with Pras in July 2022. For each of the three sessions, McKinnon synchronized the video data from the two cameras and main stereo output recordings on the SF12 recording files in Abobe Premiere Pro. The synchronization process and sequence organization of nearly 300GB of audiovisual data was facilitated by our fieldwork notes. McKinnon then indexed all the signal processing events in the DAW with markers, following a coding scheme of event categories that was co-developed with previous research assistants for the ethnography of Bamako DAW studios, namely Mix Window; EQ;

Timeline Editing; Compressor/Limiter; MIDI Editing; Change of Instrument Sound; Reverb; Delay; Variaudio; and Autotune. He added the code Sample Editing that did not appear in the Bamako study.

The indexing process also involved descriptions of the events, such as the settings of the plugins. Because a number of the camera shots on the computer screen lacked definition, McKinnon often had to deduce the parameters being manipulated by looking at the plugin layout online. Spreadsheets with the marker timings, codes, and descriptions were exported to conduct descriptive analyses of the chronology of the sessions and to count the number of technical events for each signal processing category.

5 Description of recording sessions

5.1 Workflow of three complete sessions

Figure 6 displays the three sessions' process stages based on four types of tasks that sequence the workflow of DAW music production, namely Arrangement of the instrumental; Recording of vocals; Mixing; and Mastering. It should be noted that it was possible that the DAW practitioner would rearrange the instrumental while mixing, or perform any other combination of tasks. We set as a rule that the task must have been performed for a minimum of ten minutes to appear on the workflow visualization.

To record a zouglou commercial soundtrack in Cubase, performed by multi-award-winning stand-up comedian Jacques Sylvère Bah also known as Le Magnific on July 7, 2021, Patché selected a pre-composed instrumental from his own library. This is why the work on the instrumental only lasted 12 minutes, during which Patché mostly loaded effects on the vocal track in Cubase while looping the beat for Le Magnific to rehearse. Patché treated the vocals with a telephone emulation EQ. While finishing mixing the pre-composed instrumental, he focused on treating the bass, then the high-hat, and then the synths. He also added reverb, delay, and parallel compression on the lead vocal. He did not master it because he does not know how to master. Patché worked for about four hours on this session.

The second session corresponds with the production of an Evangelist pop song titled Happy Day, composed and written by Toussaint Romantique Nguessan also known as Eyoyo, and arranged, tracked, mixed, and mastered in Logic Pro X by Charlie Kamikaze on July 19 and July 27, 2022. On July 19, Charlie collaborated with the studio owner Abdoul Karim Ouedraogo (also known as KamC) to make arrangement decisions, which increased the pressure on Eyoyo, who had a specific idea in mind for the opening of the song. On July 27, the session started with the recording of backup vocals performed by four chorists from Eyoyo's church: Sephora Allomo, Esther Kanoussey, Enji Kilola, and Eric Guessan, also known as Ricky.

It took Charlie one hour and ten minutes to arrange the instrumental from scratch, based on his inspiration from hearing Eyoyo's composition at the beginning of the session. McKinnon noted that his new track template included eight plugins. He recorded and pre-mixed the lead and backup vocals over the two days for almost two hours. He mixed at a very loud level in the cabin for almost three hours and mastered for 46 minutes using meter and other sound visualization plugins. We noticed that he had reworked the arrangement of the instrumental in between the two days, including changing the song's key.

Tupaï created a beat from a retro-sounding keyboard sample from his own library on July 25, 2022 in Cubase. His friend and regular client Wilfried Ano also known as Willy Max, who is a rapper and video-clip and TV show producer, improvised a rap over the beat. Tupaï added a sung chorus at the end of the first day. Both Willy and Tupaï wrote definitive rap lyrics before we met for the second day of recording on July 28. Tupaï gave up on singing on the chorus, but he rapped.

We can see from Figure 6 that Tupaï's workflow features clear stages of production. He composed the beat for about two and a half hours. The recording of the vocals took about two hours over the two days. He mixed for almost two and a half hours and mastered in Ozone for 16 minutes. It should be noted that he was very tired at the end of the session, but he finalized the production because we were leaving the day after.

5.2 DAW signal processing events

Table 1 summarizes the number and percentage distribution of DAW signal processing events per session and per category. In total, we counted 713 events: 84 for the session produced by Patché; 248 for the session produced by Charlie Kamikaze; and 381 for the session produced by Tupaï.

Results show that Patché and Charlie Kamikaze primarily processed EQs, and almost equally used compressors/limiters, balanced levels in the mix window, and edited in the timeline. Interestingly, about a third of Tupaï's tasks consisted of balancing levels in the mix window. He also performed a fair

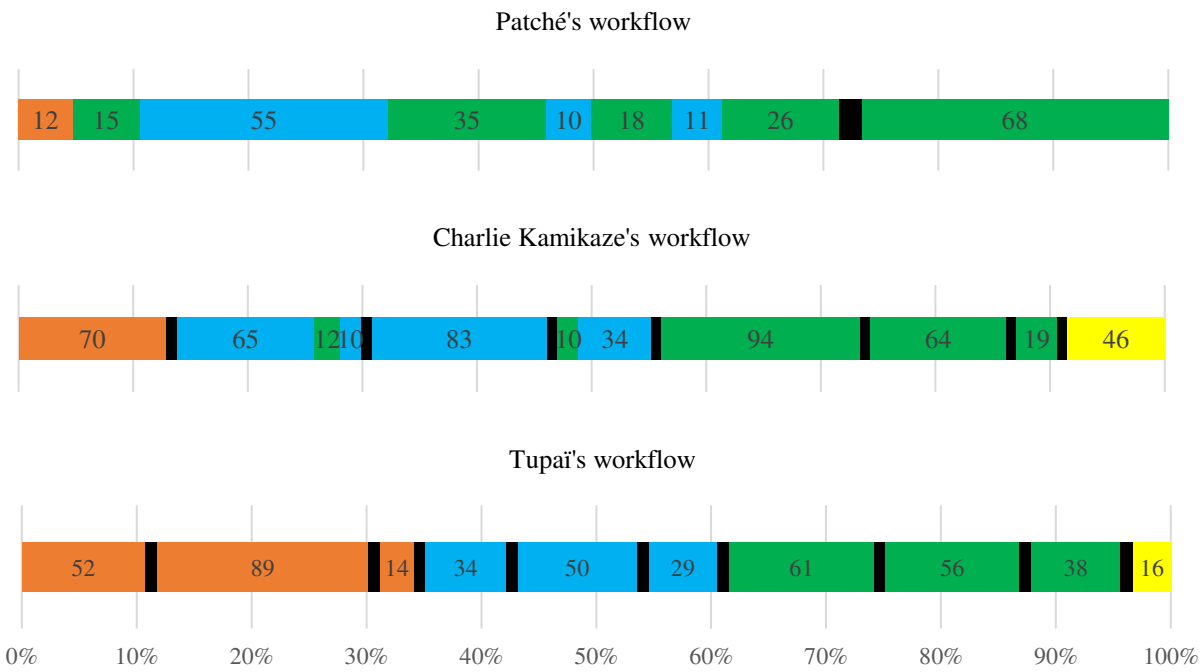

Figure 6. Chronology of the production process stages for the three recording sessions expressed in minutes and in percentage of the duration of the entire session. Orange indicates the arrangement of the instrumental; blue the recording of vocals; green the mixing; yellow the mastering, and black the breaks

DAW signal processing events	Patché	Tupaï	Charlie Kamikaze
Mix Window	11 (10.3%)	126 (31.9%)	37 (12.8%)
EQ	31 (29.0%)	58 (14.7%)	52 (17.9%)
Timeline Editing	12 (11.2%)	72 (18.2%)	36 (12.4%)
Compressor / Limiter	13 (12.1%)	21 (5.3%)	33 (11.4%)
MIDI Editing	1 (0.9%)	39 (9.9%)	21 (7.2%)
Change of Instrument Sound	0	26 (6.6%)	28 (9.7%)
Reverb	5 (4.7%)	11 (2.8%)	19 (6.6%)
Delay	5 (4.7%)	11 (2.8%)	17 (6.6%)
Sampler Edit	0	12 (3.0%)	0
Variaudio	6 (5.6%)	3 (0.8%)	2 (0.7%)
Autotune	0	2 (0.5%)	3 (1%)

Table 1. Number and percentage distribution of DAW signal processing events per session and per category

amount of timeline editing, used EQ, edited his MIDI programming, and changed the instruments' sounds. Only Tupaï edited samples, mostly to adjust the attack. This technique was widely used in 1990s hip hop production, when sampling records was at the heart of the beatmaking process. [9] Additionally, McKinnon noticed that he rarely quantizes his MIDI programming, especially the rhythmic elements, although it has become a habit in current hip hop production. We can also note that Patché never changed the instruments' sounds, most likely because he built the track upon a pre-composed instrumental.

We observed use of the variauto tool to transpose the song key, including the vocals, in the three sessions, so it is mostly like a common practice in Abidjan. While Patché did not use any autotune, Tupaï opened his autotune plugin twice, and Charlie three times, once to adapt the scale to the transposed key. Interestingly, we did not observe any use of playlists for the recording of vocals or the use of automation in the mixing process.

6 Comparison with Bamako

Whereas the five studio professionals' profiles and the three sessions that we described represent diverse music cultures and genres, our findings suggest that the creative process of Ivorian producers is commonly centered on remaking or remixing instrumentals that they select from the web or retrieve from their own past productions. For instance, we witnessed the first part of a session where Lyle Nak recorded an actor who rapped on a beat that she found on the web, to then recreate a new beat in a similar vibe to avoid having to pay for the original. This approach strongly differs from what we observed in Bamako. [2][4] While Malian producers primarily create versions of songs from their national folklore that they declinate into various genres, Ivorian producers may use samples of famous popular songs from Ivory Coast, other African music cultures, French *variété*, and international pop classics. This difference makes Ivorian pop production sound less foreign to Western ears. Nevertheless, Tupaï explained to us that he could distinguish himself from Western beatmakers with his understanding of complex Ivorian rhythms that are popular among African American rappers.

Our preliminary analyses indicate that similarly to Malian DAW practitioners, Ivorians dedicate a fair amount of their studio time to layering and editing MIDI programming and vocal recordings. However, they also spend time performing mixing tasks that consist of balancing levels and applying effects such as EQs and compressors/limiters. In contrast, Malians keep retouching the arrangement [1] until the very end of the session, and they refer to mixing for long sessions of additive and subtractive MIDI programming to underline the spirituality of the lyrics and the vocal performances. [2] We suggest that this difference comes both from the current political and economic situation of Ivory Coast being more stable and open to the global market than the on-going crisis in Mali, from the Ivorian DAW practitioners' access to international online courses, and from the rich local and multinational studio culture of Abidjan. Indeed, while in Bamako the only large-scale commercial studio is *Bogolan* that hosted the recording sessions of many Western African and international stars in the 1990s until the coup in 2012, [10] it was managed by French engineers and most of the studio professionals who came to produce and engineer there were Westerners. To our knowledge, Éliézer Oubda, who was head engineer of Bogolan in 2006-2011, is the only Western African studio professional who had high responsibilities there, and he is not Malian.

The percentage distribution of DAW digital signal processing events per category shows that Ivorian studio professionals have access to more technical knowledge than Malians. For example, we found that the most recurrent processing tool is the mix window, which we barely saw being manipulated in Bamako DAW studios throughout a dozen complete sessions. Also, Ivorian studio professionals use compressors and limiters, which was rare to see in Bamako. In contrast, Malians often open their autotune effects while Ivorians only touch them a few times during the session. Whereas we understood that Malian DAW practitioners struggled to access the global music market, we met several Ivorians, including Gabe, who work for major labels like Universal because they are in control of their mixing tools. Nevertheless, the DAW practitioners we talked to denounced the lack of local theoretical knowledge in recording, and expressed their wish to learn more methods in order to achieve the sounds that they have in mind. Specifically, many dream of being able to engineer live studio sessions with several instrumentalists playing together in acoustic settings. These reveal the needs for better local professional audio training opportunities.

It is obvious that new hardware and updated software equipment is much more accessible in Abidjan than it is in Bamako. For instance, all the emerging DAW practitioners we collaborated with in Bamako used cracked software versions - most often Cubase 5 - on Windows XP or Logic Pro X on Mac laptops that were over ten years old. In Abidjan, the studios that generate income, like the ones we filmed complete sessions in, feature the last DAW versions, decent microphones, and sometimes a few pieces of analog devices - mostly Universal Audio. On the other hand, we noticed that the studio professionals who we met in Abidjan came from upper class, which was not as much the case in Bamako. Also, while Abidjan streaming platforms and clubs do not follow the same loudness recommendations as the ones in place in the West, sound engineers know that they need to do two masters, one at -10LUFS for local playback and one at -13LUFS for international platforms. In Bamako, there was little to no awareness of the need to control the loudness in mastering.

7 Future collaborations

The July 2022 fieldwork has opened new doors for future collaborations with Ivorian studio professionals. Lyle explicitly asked that Pras teaches studio workshops to the members of her collective of women *Les Femmes Sont…* She showed us a couple of well-equipped studios in the city where she thought we could run the workshops. Our goal is now to find funding to conduct this practice with Lyle's collective and the three Malian women who participated in our audio workshop at Tadiazt in Bamako in March 2022, namely live engineer Aminata Coulibaly from Segou who was mentored by Oubda and who won the best young technician award at MASA in 2018; Marie Josepth Diakité also known as Majo DJ from Bamako; and radio technician Bintou Traoré from Bamako. All three expressed their wish to have access to women-only workshop sessions to develop their self-confidence in the studio. We would also reach out to rapper Ami Yerewolo from Bamako, who coordinates a yearly festival to empower young female Malian rappers.

The filming of complete recording sessions in Abidjan brought Pras news ways to experiment with conducting ethnographic research in recording studios as a producer. For the Bamako study, she paid extra attention to not influencing the studio practices of the local professionals to ensure the validity of the research. She also trained Digital Audio Arts undergraduate students at the University of Lethbridge – including McKinnon - to index the sessions and conduct analyses, both to provide them with a paid opportunity to learn from Western African practitioners and to add the perspectives of young DAW practitioners who produce globalized pop genres to the data. This approach enabled us to identify, in depth, the level of general education of Malian producers and their specific training needs, [10] and so to design a workshop tailored to their work contexts. For instance, the teaching respected their workflow and techniques, such as sculpting the sound around the vocals. [2] Because the DAW practitioners who we met in Abidjan have more access to online training, good equipment, and the global market, it quickly felt artificial to avoid professional discussions as equals in the studio. Pras thus accepted that she would comment on their practices, answer their technical questions, and show them mixing techniques when they asked for it, in exchange for them teaching her beatmaking techniques and letting her witness their process. This gave her ideas for teaching other professionals in the field outside of West Africa, e.g. the participants of the Women in the Studio National Accelerator program founded by Music Publishers Canada.

This research contributes to critical ethnography studies based on "developing a rapport with those involved" to "allow greater access to their thoughts and ideas" [11] and to enable knowledge exchanges and culturally-adapted solutions in higher education. Our partnership also aims to facilitate connections between our Western African Audio Network and the international community. So far, we have provided seven studio professionals who we met during our respective fieldwork with an AES membership, including Oubda who presented online at AUDIO+ hosted by Kirk McNally and Pras at the University of Vicoria (BC) in Nov. 2020, [12] and who was the first African sound engineer invited to be on the jury for the Student Recording Competition in Fall 2021. We hope that the AES community will continue to welcome these new members.

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