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Artist Representation in the Electronic Dance Music Festival Circuit

FESTIVALS AS FIELD-CONFIGURING EVENTS AND NETWORK ANALYSIS OF THE CURRENT FESTIVAL CIRCUIT

Master Thesis
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Abstract

As electronic dance music has been adopted by the mainstream culture and become widespread throughout the globe, electronic dance music scenes have developed in virtually every country – with a corresponding microcosm of artists, labels, promoters, managers, booking agents, programmers, and a plethora of other players. At the heart of the electronic dance music industry lies the live performance, which has steadily moved from derelict nightclubs to the stages of massive open-air festivals, making the latter the most important arena for electronic dance music. The current electronic dance music festival circuit is a well-integrated global network, with DJs and live performers flying across the world to perform at different festivals, however, there have been claims that this integration is only benefitting artists from certain regions of the world, namely, those deemed 'Western' or from the 'Global North'. Re-formulating these claims into a research question, this thesis empirically tests whether there is indeed a unilateral flow of artists from 'developed' regions of the world to the festival circuits of 'underdeveloped' regions of the world.

The methods utilised are quantitative and use network analysis as well as a large dataset in order to answer the research question. The thesis begins with a literature review that builds a framework for why the existence of artist underrepresentation in the electronic dance music festival circuits is important, and how it can have real impact on artists careers. Furthermore, it formalises ways in which electronic dance music festivals can be studied as they are relatively new territory in terms of academic research.

The results from the network analysis indeed point towards a unilateral flow of artists from 'developed' regions of the globe to festivals in 'underdeveloped' regions of the globe. At the same time, festivals in these 'developed' regions do not book artists from 'underdeveloped' regions barring a few exceptions. Furthermore, and perhaps most interestingly, the 'superstar' artists which achieve success in more than one continent's festival circuit turn out to be overwhelmingly European or North American.

Keywords: electronic dance music, festivals, artist representation, network analysis

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1. Introduction

The landscape in which electronic dance music is performed has seen dramatic evolution since 1984, when the inception of the genre can be said to have officially taken place in the form of Chicago house with the pressing and release of DJ Jesse Saunders' track On and On. In the early 1980s, The Warehouse, a gay disco club situated in a former factory building in Number 206 South Jefferson Street, Chicago, USA, was arguably the only venue in the world where the public could go to listen to *the house*, the genre developed by DJ Frankie Knuckles through the extension of intros and instrumental sections of disco tracks during live performances which would be seminal in the creation of all electronic dance music genre-offshoots (van Bergen, 2018). Today, electronic dance music events are held everywhere from abandoned factories to national stadiums, drawing millions of people every year and generating over 70% of the 7.3 billion dollars generated by the electronic dance music industry (Watson, 2018). These live performances take place in venues and festivals all around the world – and are sometimes very different in nature from the factory on South Jefferson Street where it all began.

The house genre was quick to catch on in an era of fast air travel and digital interconnectedness. Only a couple of years after its inception, in 1986, "Love Can't Turn Around" by Farley "Jackmaster" Funk and Darryl Pandy became the first house record to reach international mainstream popularity when it entered the UK Singles Chart. It is no coincidence that the UK became the first country to embrace house music, as strong music-industry bonds, shared infrastructure, and common practices were

present between the United States and the United Kingdom since the era of the Beatles and the Rolling Stones (Negus, 1999).

Back in Chicago, the development of the genre continued. Producers experimenting with new mass-produced synthesisers such as the Roland TB-303 produced melodic electronic squelches which in harmony with the repetitive percussive loops of house music gave birth to a defining genre which would open the floodgates to the mass internationalisation of electronic dance music – acid house. In 1987, the first acid house track "Acid Tracks" by Phuture was pressed and released, popularising the genre in Europe. In his book on the arrival and growth of house music in the Netherlands, van Bergen (2018) details the geographic trajectory the genre traversed, first arriving from the US to the cities of Manchester and London, as well as the Spanish island of Ibiza – forming a geographic triangle of house music connected by a large flow of young holidaymakers. Contemporaneously, Belgian and Dutch DJs such as Eddy de Clercq and Joost van Bellen facilitated the genre's leap across the North Sea to the Benelux through their contact with the London scene (van Bergen, 2018). Through its expansion, house music has been reshaped into a number of genres with a varying degree of stylistic differences that all now fall under the umbrella term of electronic dance music. Belgian new beat developed in Antwerp, Balearic beat in Ibiza, Hardcore/Gabber grew out of Rotterdam, Berlin crafted its own techno sound, Italo (i.e. Italian) house resulted from the fusion of Italo disco and Chicago house, Kwaito was born in Johannesburg after house landed in South Africa, trance music became the official sound of Goa, India, Nortec evolved from techno against the backdrop of Tijuana, and the list goes on. This paints a picture of the global networks and webs that electronic dance music created in its wake, with each geographic region fostering a microcosm of artists, labels, promoters, managers, artist handlers, programmers, booking agents, critics, and a plethora of other players around themselves.

These microcosms regularly interact with each other as promoters and programmers from one part of the world contact artist managers and booking agents in other parts of the world in order to book artists they like and find could have success in their region. All of this is facilitated by the fact that electronic dance music artists are highly mobile, with a large share not needing to carry any equipment as they can perform with standardised mixing consoles provided at the venue they are playing. Theoretically, the low costs of mobilising an electronic dance music artist bestow an extra dimension of freedom to promoters and programmers, who have one less hindrance to deal with in their search to secure artistic talent for their event.

Recently, a controversial discussion in regard to what talent is booked has begun and cast a shadow over the seemingly utopian touring conditions that electronic dance music benefits from. The discussion centres around a claimed unilaterality in the flow of artists that travel to different regions of the world to perform and was most prominently expressed by Brazil-based Chilean artist Valesuchi

(see Figure 1 below). In her denouncement, Valesuchi highlights the programming choices of Dekmantel, a Dutch electronic dance music festival organiser, which failed to book any Latin American artists for its Amsterdam edition while at the same time holding an official edition in Sao Paulo where European DJs are continually programmed and booked. Furthermore, in the Sao Paulo edition Latin American artists are allegedly offered 'local slots' with 'non-negotiable fees' (i.e. are presented as opening acts and are paid less) that are justified by the visibility the artists will receive after playing at a prestigious festival of the electronic dance music circuit.

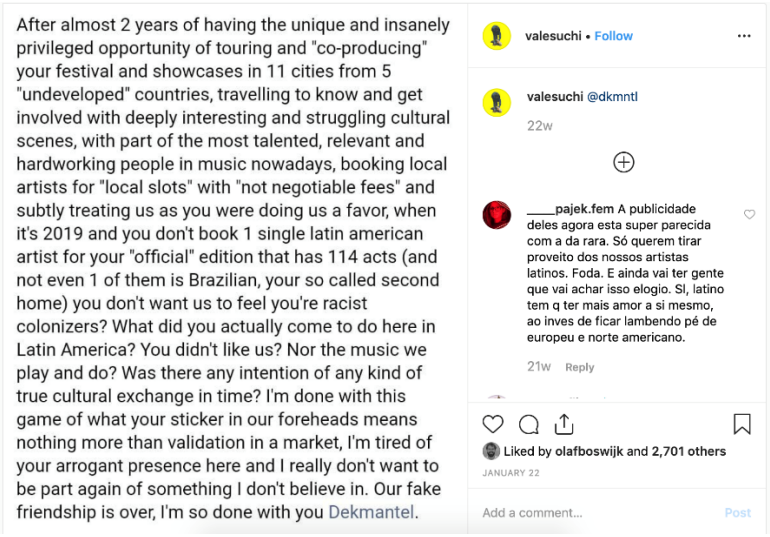

Figure 1.Valesuchi's post denouncing the lack of Latin American artists at a European electronic dance music festival.

While the statement is anecdotal, it finds support from previous research into Eurocentrism in the arts (see Buchholz & Wuggenig, 2005, Quemin, 2013) and contains undertones of postcolonial thought which has been steadily incorporated into the study of art over the past years. The most important question that arises from this charged statement is whether this occurrence is a blip or whether it is part of a systematic underrepresentation of artists from countries belonging to the 'Global South'. If this were a blip, an oversight from one festival organiser, then the consequences for the electronic dance music industry – outside the negative publicity suffered by the festival organiser and the disappointment of Latin American electronic artists that do not get to play at Dekmantel – are minor. On the other hand, if there is systematic underrepresentation of artists from 'underdeveloped' regions as a result of a unilateral flow of artists from 'developed' regions to these 'underdeveloped' regions, the consequences on artist development and the well-being of the electronic dance music circuit are serious. Thus, the central question of this thesis is:

Do electronic dance music artists from certain regions of the world feature more prominently in the different electronic dance music festival circuits than others?

In order to answer this question, which is of a descriptive nature, this thesis will resort to large data and employ an empirical quantitative methodology. Network maps of the global festival circuits will be constructed to show how artists and festivals relate to each other across geographic regions, pinpointing the flows of artists to different festivals across the world and establishing whether there is in fact a unilateral flow of artists between different regions. Before carrying out this quantitative analysis, the literature review will present a framework for the electronic dance music festival circuit, which will outline some of the reasons for why artists are rightly concerned about underrepresentation in the festival circuit and how this underrepresentation may impact them.

Why is it important to study the festival circuit in order to analyse underrepresentation and core-periphery relations in the field of electronic dance music? Firstly, although electronic dance music has rapidly cemented its place in the charts of the recorded music industry, its essence has without a doubt always been the live performance. Van der Velden & Hitters (2016) describe it as "a genre that builds on the release of separate singles or EPs in order to boost frequent live performances," highlighting how in electronic dance music the record takes second stage to, and in fact acts as a tool for the crafting of, successful live performances (i.e. DJ sets). This is in stark contrast to the traditional music industries (e.g. rock) where the record is the main cultural and economic product (although this is changing in recent years). Given the important place that live performances occupy in electronic dance music, they are worthy of close analysis. Secondly, festivals have overtaken clubs as the most powerful arena of the electronic dance music industry in terms of power and economic value. As DVS1, a Berlin-based American DJ has explained, festivals are "such a big part of this [the electronic dance music] scene, culture, industry, whatever you want to call it… that I do think that the balance [between clubs and festivals] has fallen out of balance… it used to be at the beginning that clubs used to take a 'summer break', they would call it. The reality was it was their peaceful way of saying we can't compete [with festivals] so we're just going to take a little break" (Khutoretsky, 2019). The third reason the festival circuit is of special interest is that festivals are arenas densely populated with industry-insiders, thus artists that participate in a given festival may obtain access to valuable face-to-face interaction with local gatekeepers, which can determine their participation in future events in the geographic region.

The thesis will be structured in the following manner: the literature review (Section 2) will provide an account of the rise of festivalisation in the electronic dance music industry, frame festivals as field-configuring events, and present an overview of network analysis and economic geography. Subsequently, the data and methodology section (Section 3) will outline the type of data that will be utilised in the network analysis and the necessary transformations in order to ready the data for analysis. Section 4 will present the results, analyse the findings, and present a discussion on these.

Section 5 will present the limitations of the study and Section 6 will conclude with an overview of what has been found through the study.

2. Literature Review

2.1 From Nightclub to Festival: Why the Electronic Dance Music Industry Has Changed its Domain

As noted in the introduction of this paper, the event format in which electronic dance music artists are presented has evolved drastically since the inception of house music in the 1980s. The main driver of this change has been festivalisation, which has moved electronic dance music events from the nightclub to the open air festival stage and has coincided with a more general, music-industry-wide trend for live musical performances to be carried out in temporary (outdoor) festivals instead of programmed into traditional venues such as concert halls or nightclubs. Frey (1994) identifies two supply-side and two demand-side incentives that explain the growth of music festivals which will be elaborated upon to explain the growth of the number of electronic dance music festivals and show why festivals have come to overtake nightclubs as the most powerful venues for electronic music performance. The supply-side incentives are (1) the regulation of conventional venues and (2) the cost advantages of festivals over conventional venues, while the two demand-side incentives are (1) an increase in real disposable incomes with a larger share of these being spent on the arts and (2) an increase in the amount of time and money spent on holidays.

The regulation of electronic dance music's conventional venues, nightclubs, has been well documented. The flexibility of nightclubs as venues for electronic dance music performances has been stifled by strict regulation, restriction, and policing. From strict opening times, to required levels of sound proofing, to a scarce number of available operating permits, to locational restrictions, nightclubs face a number of factors that curtail the number, duration, and nature of electronic dance music performances that can be programmed and executed (Crim, 2008). Furthermore, nightclubs face severe potential punishments at the hands of regulatory authorities in the case that the latter believe that a nightclub has violated any type of regulation. These punishments range from permanent closure (e.g. fabric London in 2016, which has since reopened thanks to a petition signed by more than 100,000 people), to temporary license suspension, seen for example in the sudden closure of six Belgian nightclubs (Club Vaag, Café d'Anvers, De Shop, Club Lima, ROXY ANTWERP, and Kompass Ghent) in March 2019, with the only successful appeal to the decision currently being that of Kompass Ghent.

Festivals, on the other hand, have a lower probability of incurring these costly fines and sanctions due to their short time duration. Although a festival that infringes its agreement with the

local authorities, for example by not stopping the music at the agreed time, faces the possibility of not being granted a permit for its next edition, the potential cost of this is still lower than the costs nightclubs face as a result of run-ins with authorities due to the different ways in which the two entities incur their costs. Nightclubs require a high initial investment and their payoffs are conditional on the constant positive perception of the venue by authorities, on the other hand, festivals typically disburse the majority of their production costs after having received the approval of the permit-granting authorities. This means that the expected economic loss at the hand of regulation authorities is greater for nightclubs than festivals, due to the difference in the timing at which most of their investment in infrastructure and production are incurred, making it more attractive for promoters to work within the realm of festivals than nightclubs to organise their events.

Next to these legal restrictions, there are manifold cost advantages that festivals hold over nightclubs. The first cost category in which festivals have lower costs is personnel. Conventional venues and concert halls typically employ their administrative and technical staff through long-term contracts. This form of employment increases the venue's personnel costs as they must cover employees' fixed costs such as health benefits, paid-holidays, and retirement plan contributions, which make up a considerable part of gross income (Frey, 1994). On the other hand, festivals employ only a small team of administrative personnel permanently, while the remaining administrative staff can be hired temporarily on the basis of non-paid internships or volunteering, thus allowing the festival organisers to legally bypass these fixed costs (Frey, 1994). Furthermore, any physical on-site labour that festivals require, from the build-up stage to the execution of the festival to the build-down stage, can be obtained for free through volunteers (see Barron & Rihova, 2011, Elstad, 2003, and Monga, 2006, amongst others for volunteer motivation to volunteer at festivals).

The second cost category in which festivals have a cost advantage over nightclubs is rent. The nightclub life cycle is largely dictated by real estate prices. In the first stage of the lifecycle, a nightclub entrepreneur will open a venue in a disinvested or industrial district due to the low rent and the typically unrestrictive neighbourhood associations and police enforcement found in these areas (Crim, 2008). As the venue generates foot traffic in the area, complimentary services such as bar and restaurants begin to establish in the area and rent prices increase (see Florida, 2002, for creative district clustering mechanics)- which especially affects nightclubs as they are often the lease-use least able to compete with other lease-uses (Crim, 2008). The final stage of the lifecycle occurs when prices in the sector rise to such an extent that landowners see greater return opportunities in leasing for housing or office rental spaces purposes rather than nightclub activities, thus ending the leases to nightclub entrepreneurs, who will in turn have become alienated by the commercialisation of the district that was once led by them and will choose to move on to a new part of town (Lavanga, 2013).

Electronic music festivals, on the other hand, are not subject to these urban developments and constant rising rents. Indoor electronic music festivals utilise already existing structures such as derelict warehouses, factories, or office spaces, and may also be able to use the spaces at a very low marginal cost as the landowner or developer of these spaces perceive the opportunity of a short-term lease to a festival as an extra income source (Crim, 2008). Furthermore, many electronic dance music festivals take place outdoor, in public spaces such as parks or areas deemed culturally significant (Montano, 2011) which due to their public nature and typically non-urban location have a clear cost advantage over more central locations.

On the demand side, the increase in real disposable incomes coupled with a larger share of disposable income being spent on cultural entertainment has benefitted both nightclub and electronic dance music festivals. At the same time, however, the benefit has been much larger for festivals, as festivals occur mostly within the summer holidays, and as Frey (1994) points out this newly available income being spent on cultural entertainment is largely allotted to the holiday season. Amongst the reasons cited for this is that during the working season, workers now face a larger opportunity cost to attend cultural entertainments due to the increase in wages, while at the same time they face a lower opportunity cost of attending cultural entertainment during the summer season as the amount of holiday time available to them has largely increased (Frey, 1994). Furthermore, individuals may perceive festivals to be a more efficient way of producing the consumer good 'entertainment' as electronic dance music festivals are usually not only composed of aural goods in the form of live performances, but also include other entertainment sources such as food trucks and art installations.

Beyond these economic factors, the rise of the electronic dance music festivals and its overshadowing of the nightclub as the main terrain for electronic dance has been analysed through the lens of marketing and commodification. Montano (2011) finds, through his analysis of the electronic dance music ecosystem of Sydney, Australia, that electronic dance music events hosted in nightclubs were unfit for mainstream consumption due to their associations with "dark and seedy territory" and "illegal drug taking," elements which the general public does not immediately associate with festivals as they are set in outdoor, public spaces, and thus situate electronic dance music "within the wider cultural mainstream."

In accordance with the economic advantages of electronic dance music festivals over nightclubs listed above, festivals have proliferated throughout the world much to the economic cost of the club scene. Through the analysis of statements by Sydney-based electronic dance music industry insiders, Montano (2011) found that the oversaturation of the festival market and its intense competition has side-lined weekly clubnights in terms of attendance, as well as made it tougher for clubs to secure artistic talent due to the inflated appearance fees that the competitive festival

environment fosters. Accordingly, club night promoters in the city have found an incentive to stop holding regular events in these traditional venues and instead focus on irregular, one-off events similar in nature to festivals. Both the audience and the industry-insiders have thus moved towards a festival-based model, definitively allowing festivals to become the prime arena in which the individuals that make up the field of electronic dance music interact. The figures corroborate the quick growth of festivals. In China for example, the number of electronic dance music festivals has grown by a hundred since 2016. Similarly, leading festival organisations continue to add events to their portfolio, with Ultra Worldwide Events adding 23 events in 2017 (Watson, 2018).

These developments in the electronic dance music scene make festivals the most relevant space to analyse in order to decipher field trends and patterns, and this is the reason why festivals are the focal point of this study. In the following section, literature on field-configuring events will be presented in order to explain the mechanics within these events and their importance through a scientific framework.

2.2 Electronic Dance Music Festivals as Field Configuring Events (FCEs).

Economic advantages have contributed to making festivals a central part of the electronic dance music circuit. In order to understand the dynamics of this proliferating event format, a framework which describes the processes that take place at these events and their effects must be found. As will be shown in the following section, the literature on field-configuring events can show us precisely how electronic dance music festivals act as places for players of the electronic dance music industry to coalesce and steer the field in a chosen direction. Field-configuring events are periodical or one-time temporary social organisations in which individuals from diverse organisations within a field and who hold different positions assemble in a delimitated geographical location. Through their interactions at these events, the attending individuals agree on the direction of future developments in the field, effectively shaping the evolution of the field (Meyer, Gaba, & Colwell, 2005). As Lampel & Meyer (2008) put it, FCEs are "arenas in which networks are constructed, business cards are exchanged, reputations are advanced, deals are struck, news is shared, accomplishments are recognised, standards are set, and dominant designs are selected." While several of these actions are more appropriate in discussing a car manufacturer convention than an electronic dance music festival, the underlying logic of industry-insiders convening in one location during a limited period of time is similar. FCEs shape the future of a field, and in the following paragraphs this study will set out to illustrate the various facets of electronic dance music festivals that effectively allow them to configure the field of electronic dance

music by analysing how well the characteristics of electronic dance music festivals fit the six characteristics of field-configuring events put forth by Lampel & Meyer (2008).

The first defining characteristic of FCEs is that they assemble actors from diverse professional, organisational, and geographical backgrounds in one location (Lampel & Meyer, 2008). In their examination of film festivals as FCEs, Rüling and Pedersen (2010) identify that an important aspect of these events is the wide scope of film industry professionals that attend, including artists (actors, directors, etc.), media representatives, cultural policy actors, as well as the wider audience that may not be affiliated to the film industry. The heterogeneity of the roles represented is needed in order to make sense of the industry's social power structure. Similar to film festivals, electronic dance music festivals are an arena where the programmed artists, the festival organisers, media representatives, and the (paying) public gather. In these events, not only are individuals placed within the same geographical location at the same time, but they are also placed by the festival organisers into accreditation categories which denote different levels of power within the ecosystem of the festival and are indication of each individual's standing with respect to the wider electronic dance music industry. Usually, these power relations and different positions are coded into accessories of unique characteristics given to the participants, such as differently coloured badges or wristbands which grant access to different areas or sub-events within the festival. Thus, as Rüling and Pedersen (2010) point out, "power in festivals is both symbolic and material" and festivals are a perfect arena for discerning different individuals' importance as, for reasons of internal organisation and logistics, they assign individuals attending the festival with a visible signal of their power position in the form of the accessories previously mentioned. As an example, in large electronic dance music festivals festival workers who hold positions such as production or backstage manager are granted access to the backstage areas where artists are also allowed to enter, while volunteers of the festival, though still 'insiders' of the festival organisation, are not granted backstage access. This establishes clear boundaries between the different actors, highlighting their professional backgrounds and positions within the organisation.

In regard to the diversity of geographical backgrounds of the actors, electronic dance music festivals usually programme artists from more than one country, while the festival organising team is usually local to the geographic location where the festival is being held. For example, in the 2018 edition of Ohm Festival, a small to mid-size festival in the Netherlands with an estimated attendance 3000 people (Electronic Festivals, 2019), a line-up of 26 artists represented six different nationalities. In conclusion, electronic dance music festivals fit the first characteristic of field configuring events described by Lampel & Meyer (2008). This shows how electronic dance music festivals are grounds that reinforce an individual's position as part of the electronic dance music scene, through a system of

signals and accreditation put in place by the festival. One can then start to see one of the reasons why taking part in these events can be important to artists.

Figure 2.The area behind the DJ is typically accessible only to the stage manager, festival-organisers, and other industry-insiders with the appropriate accreditations.

The second defining characteristic of FCEs is their limited duration, which ranges from a few hours to a couple of days at most (Lampel & Meyer, 2008). This is the case with electronic dance music festivals where the duration, although it varies between festivals, usually ranges between one and four days thus falling into the limited time-range of a field-configuring event (Electronic Festivals, 2019).

The third defining characteristic of FCEs is that they provide opportunities for face-to-face interactions between the present actors in an unstructured format (Lampel & Meyer, 2008). According to Maskell, Bathelt, and Malmberg (2006), these face-to-face interactions taking place in temporary clusters of industry-insiders are crucial for the establishment of strong, trustful relationships, and may even build stronger relationships than regular day-to-day interactions amongst individuals that are part of the same permanent clusters. One can the start seeing how interactions which occur at the festival site between organising actors of the electronic dance music industry such as promoters, programmers, artist handlers, and on the other hand non-organising actors (i.e. artists), can build the basis for future collaborations and may result in the artists being booked again for the next edition of the festival.

The fourth characteristic of FCEs is that they include ceremonial and dramaturgical elements designed to elevate the value of the event beyond its physical concreteness through symbolism (Rüling & Pedersen, 2010). Sociology has studied these aspects of electronic dance music festivals extensively. Till (2009) notes the position of the DJ in respect to the crowd as one of these elements, with the booth usually placed high up in the air to denote the importance of the music source within the event. Artistic elements may also nod to important occurrences within the festival programme, for example lights may be turned up in order to signal to the crowd that one DJ is handing over the booth to another DJ, a moment typically accompanied by the audience's applause in recognition of the transition. These short ceremonies create a common festival language which provide orientation for both the public and the organisers, transferring information such as which DJ set was best received or what unreleased tracks had the biggest impact when played. These ceremonial and dramaturgical elements form part of a

wider process of collective sense-making which takes place in electronic dance music festivals, which fit the fifth defining characteristics of FCEs, namely, that they act as grounds that provide the chance for easy exchange of information amongst individuals. If an artist is consistently not present in a festival, then they miss out on these processes of collective sense-making and information exchange. The sixth and final defining characteristic of FCEs is that they generate social and reputational resources that can then be utilised in the field even after the event has terminated (Lampel & Meyer, 2008). One concrete example of this in electronic dance music festivals is the creation of the festival aftermovie, pioneered by Tomorrowland and Ultra, which serves the purpose of promotion in the context of differentiating the electronic dance music festival from the rest and aim to create a need to relive the festival experience (Holt, 2018). The aftermovie is thus a resource to legitimise what took place at the festival.

As has been shown, the six defining characteristics of FCEs appropriately describe the aspects of electronic dance music festivals. The events which take place throughout the festival, as well as the interactions between artists, festival-organisers, and the audience, creates a common language that reinforces the social network ties between all present individuals. One can see then why artists value taking part in electronic dance music festivals at an individual level. At a larger scale, when a large cohort of artists are left out from an event this could be even more detrimental as an entire scene is being left out of the conversation with the wider electronic dance music world. This highlights the importance of programming decisions made by festival organisers for the prospects of artists. In order to understand the role of programming as a gatekeeping mechanism to field-orienting events, the following section will look at the extant literature on programming incentives and how these can create a feedback loop in the inclusion of certain artists and exclusion of others.

2.3 Programming as a Gatekeeping and Field-Orienting Mechanism in Electronic Dance Music Festivals

Festivals are the main FCEs in the electronic dance music industry. Since electronic dance music festivals act as arenas which produce field-changing occasions and interactions, their organisers will aim to design the festival in a way that steers the resulting evolution of the field in their direction and benefit (Lampel & Meyer, 2008). The main way for festival organisers to steer field evolution in their direction is to produce a festival that will be well-received by the audience, artists, and local permit-granting authorities. This will create a buzz around the festival and will contribute to its survival and the success of the next edition. As Rüling (2011) puts it, event organisers must continuously work to institutionalise and position their event in a competitive event landscape and maintain its status. But what tools to ensure success do electronic dance music festivals have in their possession?

In their study of music festival success and failure in Finland, Kinnunen & Haahti (2015) find through Foucauldian discourse analysis of the audience experience descriptions that one of the main success factors identified by the audience is the festival programme. Similarly, Yan, Zhang, and Li (2012) find, through the analysis of a Chinese combined arts festival, that programming quality is a significant predictor of audience satisfaction and the audience's behavioural intentions, meaning that good programming would lead the audience to say positive things about the festival to other people and recommend attending the festival. In their study of the International Andong Mask Dance Festival in South Korea, Lee Y.K., Lee C.K., Lee S.K., and Babin (2008) find that good programming, determined by an audience, drives positive emotions in the festival audience, leading to audience satisfaction, and loyalty to the festival (i.e. a higher likeliness to return for the next edition). Leenders, van Telgen, Gemser, and Van der Wurff (2005), who studied the determinants of success for Dutch music festivals, find that the inclusion of star artists in festival lineups (programmes) is not a significant determinant of festival success in terms of festival attendance growth. This, however, does not mean that programming itself is not an important factor of festival success but rather that the programming of star-artists is not a guaranteed way to attract an audience to a music festival. The programme is a vital component of the festival, and thus festivals are faced with the important task of programming a curated line-up that will be well-received by both the audience and industry-insiders. Through 'good' programming, an electronic dance music festival can turn the heads of the electronic dance music field towards itself, and in the process increase its status amongst the large number of festivals on offer. Having established the importance of programming as a factor for the success of electronic dance music festivals, it is important to understand which artists festivals are including in their programme since, as demonstrated by the field-configuring event literature, these choices will filter who will participate in the field-configuring processes and who will not.

Live performances are a big part of the career trajectory of electronic dance music artists – and the festivals at which these performances take place can be important factors in the artists' legitimisation and consecration process much in the same way exhibiting at a prestigious gallery can affect a visual artists career. As stated in the introduction, the essence of electronic dance music is the live performance – both artistically and economically. The industry makes most of its revenue from live performances at festivals or clubnights and artists' main source of earnings comes from performing live, leaving other earning sources such as streaming royalties from music distribution platforms or music sales far behind (Citigroup, 2018). All these factors lead to a vast supply of artists willing to perform in electronic dance music festivals, a supply much greater than the number of performance timeslots available at the current number of festivals. This leads electronic dance music festival programmers to pay great attention to the talent they book and the way they programme and schedule

artists within the timeslots available in their festival. Programming thus takes centre stage as the main gatekeeping mechanism for artists, as being included in a festival programme has the power to legitimise their artistic abilities while never entering the festival circuit could hinder their legitimisation process. As stated by DVS1 in the same interview cited in the introduction, "festivals are now starting to compete on such a high level with each other that they are booking the same names… I crossed the line into – let's call it the festival circuit – and then suddenly all the festivals want to book you" (Khutoretsky, 2019). This is a testament to the impact of festival programmers on the legitimisation and prospects of electronic music artists – but it also says something about the homogenous programming behaviour of electronic dance music festivals. This sort of 'copy-cat' programming is in line with Adler's (1985) superstar theory, and although it leads to repetitive lineups it also makes the most economic sense for festivals that need to recoup their expenses through ticket sales. Furthermore, it is explained by the herd-behaviour that Caves (2000) describes, where in order to reduce the search costs of programming, programmers look at what other individuals or organisations in the electronic dance music field are producing and consuming. One can then talk of concentration in the programmes of the electronic dance music festival circuit, which Rosen (1981) describes as the situation when a small number of artists dominate the activity in which they engage. These programming trends essentially describe a feedback effect which amplifies the benefit of performing in a festival – while also amplifying the negative side of not being booked. Because of these vast implications, it becomes interesting to assess whether there is systematic underrepresentation of artists from certain geographic regions in the current global electronic dance music festival circuit. To assess this, this study will resort to network analysis and thus the following section will present a review of extant literature on network analysis and economic geography.

2.4 Networks and Core-Periphery Relations in the Electronic Dance Music Festival Circuit

Due to its recency, the electronic dance music festival circuit can be defined as a creative industry in which the value of the product (i.e. festival) is dependent on complex social networks (Potts, Cunningham, & Hartley, 2008). These complex social networks serve to make sense out of the highly uncertain quality of a festival, with word-of-mouth, reputational resources, and popularity all serving as quality-indicators. For festivals, being linked to artists that have established themselves within their network will work in their favour to being perceived as a good festival. On the other hand, for artists, being linked to a festival that has steadily accumulated a good reputation in the circuit will have positive effects on their career prospects as explained in the previous sections. Social networks are thus crucial

in the electronic dance music industry and this is the main reason why observing these links can elucidate many (negative or positive) trends about what artists are booked in the current festival circuit.

There is a number of empirical studies that have employed network analysis in order to map the social networks that exist within a certain creative industry. In their research on galleries present at the Art Basel contemporary art fair, Curioni, Forti, and Leone (2015) identify galleries as organisations that are connected through the artists in common that they exhibit at their fair stand. Through this approach they are able to calculate the centrality degree of both the galleries and the artists within the Art Basel network and see the demographic characteristics of the artists and galleries that are most situated at the core of the network (i.e. high centrality) and those that are situated at the periphery (i.e. low centrality). This approach can be replicated for electronic dance music festivals. In their research on popular music festivals as FCEs, Paleo and Wijnberg (2006) state that the extent to which a festival is embedded in the relevant network of its field can be measured by determining the number of individuals with which a festival has significant relations. This measurement can be both absolute, by taking into consideration only the number of connections of a festival, or relative, by also taking into account the centrality of these connections. If electronic dance music festivals are thought of as the nodes in a network and the artists that perform at these festivals as the ties between the nodes, a map of the electronic dance music circuit can be generated, and centrality scores can be assigned to festivals and artists.

Why is understanding which artists and festivals are at the core of the circuit and which are at the periphery important in order to understand the implications on artists? Firstly, core-festivals will have a larger field-orienting power. This means that artists that are programmed at these festivals will benefit by taking part in the conversation, common sense-making activities, face-to-face interactions, and social and reputational resource creation that takes place on the festival site. On the other hand, artists excluded from these core festivals may be able to do this at peripherical festivals, but the benefit will not reach the extent of that derived from participating in a core-festival. Secondly, field-configuring events (i.e. electronic dance music festivals) have a path-dependency component (which will dictate the outcome of how future editions of the festival are formatted and who participates. The social link between the artists that are programmed at a festival and the festival organisers and industry-insiders present will strengthen on-site during the event. This can lead to artists in core-festivals to be invited again for the next edition, while the artists in the periphery are further side-lined by their non-presence. This theoretical self-reinforcing mechanism makes the implications of artist underrepresentation vast with underrepresented artists being less able to shape the electronic dance music field. Thus, in the following section this thesis aims to identify whether artists from certain geographic regions occupy more central positions in the festival circuits of the world.

3. Data and Data Methods

3.1 The Datasets

In order to conduct a network analysis and compute the centrality scores of electronic dance music festivals and artists, a list of the festivals that took place across the world and their corresponding lineup is needed. Furthermore, to understand whether there is underrepresentation of artists from certain regions of the world, the demographic information (i.e. nationality) of the artists is also required. Two databases were used for this purpose.

A first database was obtained from electronic-festivals.com, the largest online database for indoor and outdoor festivals of electronic dance music. Their mission is to cover all electronic dance music festivals worldwide, regardless of subgenre, thus creating a comprehensive list of festivals that captures the entire electronic dance music spectrum. A second database was created by collecting information from diverse sources, including industry-news website Resident Advisor, festivals' webpages, and artists' websites or official SoundCloud accounts. This second database contains the lineup of the festivals present in the electronic-festivals.com database as well as the nationality of the artists present in the lineup. The two databases were combined to create one cross-sectional database of electronic dance music festivals held in the 2018 calendar year which included information on the country in which they took place, the artists that performed, and the nationality of these artists.

The full database contained 1447 festivals – which translate into a very large number of nodes – leading to two issues. Firstly, procuring the lineup of all 1447 festivals and the nationality of all the artists in the lineup was practically unfeasible. Secondly, UCINET, the software used for the network analysis and map creation, encounters issues in cases where large databases are involved and tends to output error messages when computing centrality scores. To solve these two issues stemming from the size of the full dataset, a subsample had to be created.

3.2 The Subsample

Given the size of the network, sampling is needed in order to be able to compute centrality scores for each artist and festival. In order to obtain a network subsample that retains the main characteristics and attributes of the full network, and thus has similar properties to and is representative of the full network, there are three questions that must be answered. First, what is an appropriate sampling method? Second, what sample size is sufficient? And third, how do we measure the goodness of a single sample? (Leskovec & Faloutsos, 2006). The first step is to take a look at the available large network sampling techniques, namely, node-sampling, edge-sampling, and topology-

based sampling (Ahmed, Neville, Kompella, 2011). For this study node-sampling was chosen because it has been shown to be one of the best methods to match the 'true graph' (i.e. full network) (Leskovec & Faloutsos, 2006). In node-sampling, a number of nodes from the true graph are chosen independently and uniformly at random (i.e. through simple random sampling) and are kept for the construction of the sampled graph. Applying this technique to our dataset amounts to taking a simple random sample of the 1447 festivals present in the original dataset. Here, the second question, that regarding sample size, arises. In their paper on the sampling of large graphs, Leskovec & Faloutsos (2006) find that when using the technique of node-sampling, a sample that is approximately 15% the size of the original dataset is enough to capture the most important properties of the original network. Following this finding and in order to reduce the probability that UCINET will output an error message, this 15% criterion was used to create the subsample in SPSS.

Before executing the simple random sampling process in SPSS with this criterion, however, a second requirement that is crucial to ensure that the subsample and its results will help us answer the research question must be taken into account. Since the focus of this paper is to assess whether there is a dominance of artists from a certain region or country of the world, even in festivals that are not geographically located in these regions or countries, it should be seen to that in the process of sampling none of the different regions of the world lose or gain too much of their share of the world festival total present in the full database. In other words, the world festival circuit present in the original database must be 'shrunk proportionately'. To understand why this is the case, it is important to take a look at Table 1, which shows the number of festivals held in each continent in 2018 and the continent's share of festivals held in 2018. As can be seen, Europe is the leading continent in number of electronic dance music festivals with 820 festivals recorded in the database, more than half of the festivals that took place in the world in 2018 (56.7%) and more than the number of festivals held in all other continents combined (627). On the other hand, Africa was home to only 44 electronic dance music festivals in 2018. Applying simple random sampling to this database would risk the loss or complete elimination of festivals held in areas of the world with few observations (i.e. festivals). This would hinder the analysis and make it harder to answer whether artists from certain countries or regions dominate the festival scene even outside their home region, as the observations would very probably have been taken out of the sample. Thus, finding a way to maintain this share structure is necessary to obtain meaningful results that can answer the research question. In order to do this, the full dataset was divided into six datasets according to the six-continent geographic model, after which the simple random sampling process was applied to each of these datasets individually. The resulting subsample consists of 225 festivals (15.55% of the original dataset) and 5510 electronic dance music artists. Table 1 shows the number of festivals in the subsample for each continent, with the subsampled proportions

being, on average, 1.63% from the 'true' proportions, with the extremes being Europe (which is underrepresented by 4.9%) and Oceania (which is overrepresented by 1.58%). This subsample then had to be recoded into a matrix format in order to be analysable by UCINET (Appendix 1 shows an example of this matrix format).

Table 1. Electronic dance music festivals held in 2018 present in the full dataset and subsample.

Continent	Festivals in 2018 (total)	Festivals in 2018 (%)	Festivals in subsample (total)	Festivals in subsample (%)
Europe	820	56.7%	128	51.8%
North America	234	16.17%	43	17.4%
Asia	144	9.95%	25	10.1%
South America	128	8.85%	23	9.3%
Oceania	77	5.32%	17	6.9%
Africa	44	3.04%	11	4.5%

3.3 Metrics and Analysis

The network analysis of the subsample was conducted with UCINET, a social network analysis software capable of producing network maps and computing various centrality measures (Borgatti, Everett & Freeman, 2002). This study looks at two main measures of centrality: degree centrality and eigenvector centrality. The degree centrality of an artist is equivalent to the number of festivals that an artist has played in and are present in the subsample. It is important to note thus that the actual ('true') degree centrality of an artist may be larger than that computed through the subsample as some festivals in which artists appeared may not have been included in the subsample (i.e. excluded through the simple random sampling process). Eigenvector centrality is a more complex measure of network centrality, as it does not only take into account the number of festivals in the subsample which the artist has played, but also contains information regarding the centrality of those festivals. High degree centrality thus means that an artist has played many festivals in 2018 which are present in the subsample, while high eigenvector centrality means that the artist has played important festivals present in the subsample.

Artists derive high centrality in three ways: either they were (1) programmed by numerous festivals, (2) programmed by festivals which have an extensive lineup, or (3) programmed by festivals next to other prominent artists. These artists can be said to have entered the 'festival circuit' and have become regular participants of the on-site conversations that occur between artists, bookers, the media, festival organisers, and other industry insiders thus reaping the benefits from this in the ways outlined in Section 2. Once the centrality scores are calculated, two Top 100 lists for each continent

will be built. The first list will rank the Top 100 artists to play in the continent by degree centrality, while the second one will be ranked by eigenvector scores. Finally, the makeup of these top artists will be analysed in terms of their country of origin to establish the countries or regions whose artists are entering the Top 100 lists more than others.

4. Results, Discussion, and Implications

4.1 Degree Centrality

4.1.1 Overview of Degree Centrality Scores

The per-continent degree centrality scores and their decomposition by artist-nationality are presented in Table 3. Before discussing these, however, a few data-related clarifications must be made. Firstly, in the six Top 100 lists based on degree centrality there are 600 artist names, however, there are a handful of artists that are present in more than one of the six Top 100 lists thus the number of unique artists across the six lists is actually 564. Secondly, there are instances of missing data in regard to the nationality of some of the artists that enter the Top 100 lists which must be noted. In the Africa Top 100 the nationality of three artists could not be found. In the Asia Top 100, the nationality of seven artists is missing. In North America only one artist could not be tied to a country, while in South America that happened for four artists. In Europe and Oceania, the nationality of all Top 100 artists was retrievable. This missing nationality data is accounted for by the 'N/A' row under 'Continent of Origin' in Table 3 and makes a total of 15 artists across the six Top 100 lists for which a nationality could not be established.

The descriptive statistics of the degree centrality scores across different continents can be seen in Table 2 and the corresponding histograms can be seen in Appendix 2. There are a number of continent-specific characteristics that can be observed in the descriptive statistics. Firstly, the mean, median, and standard deviation of degree centrality vary between continents. Artists in the Top 100 list of Africa, Asia, Oceania, and South America had an average degree centrality of 1.43, 1.38, 1.17, and 1.57, respectively. In fact, the vast majority of the artists that entered the Top 100 in these continents appeared in only one festival. In Europe and North America on the other hand, the average degree centrality was 3.53 and 2.53, respectively. This shows that in order to enter the Top 100 lists of these two continents, artists have to play more shows than to enter the Top 100 lists of Africa, Asia, Oceania, or South America, pointing to a more competitive or more highly saturated festival circuit in these regions. This may be a result of two factors: firstly, the European and North American festival circuits are much larger than the festival circuits of Africa, Asia, Oceania, or South America. In fact, European festivals account for 51.8% of the total number of festivals present in the subsample that was created

(North America is a far second with 17.4%, see Table 1), thus it is more likely that of artists are booked at more than one festival, contrasting regions where only a handful of festivals exist. A second reason for this could be continent-specific characteristics such as the cost of traveling to different festivals within a continent. Good transportation infrastructures allow artists to play many festivals in the region while, in more remote regions, it makes more sense to play at one large festival and then fly off to the next region. This is reflected in the difference between the continent's maximum degree centrality scores. As shown in Table 2, the highest-ranking artists of the European Top 100 played six festivals in the continent during 2018, the highest-ranking artists in North America played five festivals, the top artists in South America played four festivals, while in Africa, Asia, and Oceania the top artists had three festival appearances throughout the year.

Table 2.Descriptive statistics of degree centrality distribution.

Continent	Mean	Standard Deviation	Median	Minimum	Maximum
Africa	1.43	0.590	1	1	3
Asia	1.38	0.582	1	1	3
Europe	3.53	0.717	3	3	6
North America	2.53	0.731	2	2	5
Oceania	1.17	0.428	1	1	3
South America	1.57	0.820	1	1	4

Another important characteristic of the degree centrality results is that the distribution of the scores are right-skewed. The distribution pattern shows that the majority of artists have low degree centrality while only a few have high degree centrality. This skewness shows that artists at the very top of the electronic dance music festival circuit are few, a result that is in line with Adler's (1985) superstar theory. Having analysed the main descriptive statistics of each continent, we will now analyse the demographic makeup of each continent's Top 100 in order to see whether artists from certain geographic regions are less present than others (i.e. underrepresented).

Table 3.Share of artists by Degree Centrality based on Top 100 list.

Degree Centrality	Host Continent						By Continent of Origin	Host Continent					
	Africa	Asia	Europe	North America	Oceania	South America		Africa	Asia	Europe	North America	Oceania	South America
6	-	-	2	-	-	-	Africa	-	-	0,0%	-	-	-
							Asia	-	-	0,0%	-	-	-
							Europe	-	-	100,0%	-	-	-
							North America	-	-	0,0%	-	-	-
							Oceania	-	-	0,0%	-	-	-
							South America	-	-	0,0%	-	-	-
							N/A	-	-	0,0%	-	-	-
5	-	-	7	3	-	-	Africa	-	-	0,0%	0,0%	-	-
							Asia	-	-	0,0%	0,0%	-	-
							Europe	-	-	85,7%	0,0%	-	-
							North America	-	-	14,3%	100,0%	-	-
							Oceania	-	-	0,0%	0,0%	-	-
							South America	-	-	0,0%	0,0%	-	-
							N/A	-	-	0,0%	0,0%	-	-
4	-	-	33	5	-	3	Africa	-	-	0,0%	0,0%	-	0,0%
							Asia	-	-	3,0%	0,0%	-	0,0%
							Europe	-	-	90,9%	80,0%	-	0,0%
							North America	-	-	6,1%	20,0%	-	0,0%
							Oceania	-	-	0,0%	0,0%	-	0,0%
							South America	-	-	0,0%	0,0%	-	100,0%
							N/A	-	-	0,0%	0,0%	-	0,0%
3	5	5	58	34	2	12	Africa	100,0%	0,0%	0,0%	2,9%	0,0%	0,0%
							Asia	0,0%	0,0%	3,4%	5,9%	0,0%	33,3%
							Europe	0,0%	80,0%	81,0%	41,2%	0,0%	25,0%
							North America	0,0%	20,0%	10,3%	47,1%	0,0%	0,0%
							Oceania	0,0%	0,0%	0,0%	2,9%	100,0%	0,0%
							South America	0,0%	0,0%	5,2%	0,0%	0,0%	41,7%
							N/A	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
2	33	28	-	58	13	24	Africa	87,9%	0,0%	-	1,7%	0,0%	0,0%
							Asia	0,0%	17,9%	-	1,7%	7,7%	12,5%
							Europe	6,1%	57,1%	-	22,4%	15,4%	20,8%
							North America	3,0%	17,9%	-	67,2%	15,4%	4,2%
							Oceania	3,0%	3,6%	-	3,4%	61,5%	0,0%
							South America	0,0%	0,0%	-	1,7%	0,0%	62,5%
							N/A	0,0%	3,6%	-	1,7%	0,0%	0,0%
1	62	67	-	-	85	61	Africa	56,5%	1,5%	-	-	0,0%	0,0%
							Asia	3,2%	32,8%	-	-	1,2%	3,3%
							Europe	25,8%	38,8%	-	-	40,0%	23,0%
							North America	6,5%	16,4%	-	-	9,4%	4,9%
							Oceania	1,6%	1,5%	-	-	47,1%	0,0%
							South America	1,6%	0,0%	-	-	2,4%	62,3%
							N/A	4,8%	9,0%	-	-	0,0%	6,6%

Africa

On the right half of Table 3, each continents' degree centrality categories are decomposed by the continent of origin of the artists present in the category. Centring on the African festival circuit, it can be observed that the five artists who played three festivals in the continent, and thus have the highest degree centrality in the Africa Top 100, are from South Africa. These artists are Chunda Munki (SA), RoomMush (SA), STAB Virus (SA), Strange Loving (SA), and Tersius (SA). Moving down in centrality scores to the artists who played two festivals in Africa, we find that from the 33 artists in this category 87.9% (n=29) come from an African country, 6.1% (n=2) come from a European country, 3% (n=1) come from North America, and the last 3% (n=1) come from Oceania. In the lowest degree centrality category of the Africa Top 100 we find 62 artists, of which 56.5% (n=35) are from Africa, 25.8% (n=16) are from Europe, 6.5% (n=4) are from North America, 3.2% (n=2) are from Asia, 1.6% (n=1) are from Oceania, 1.6% (n=1) are from South America, and 4.8% (n=3) have missing nationality data (Figure 4).

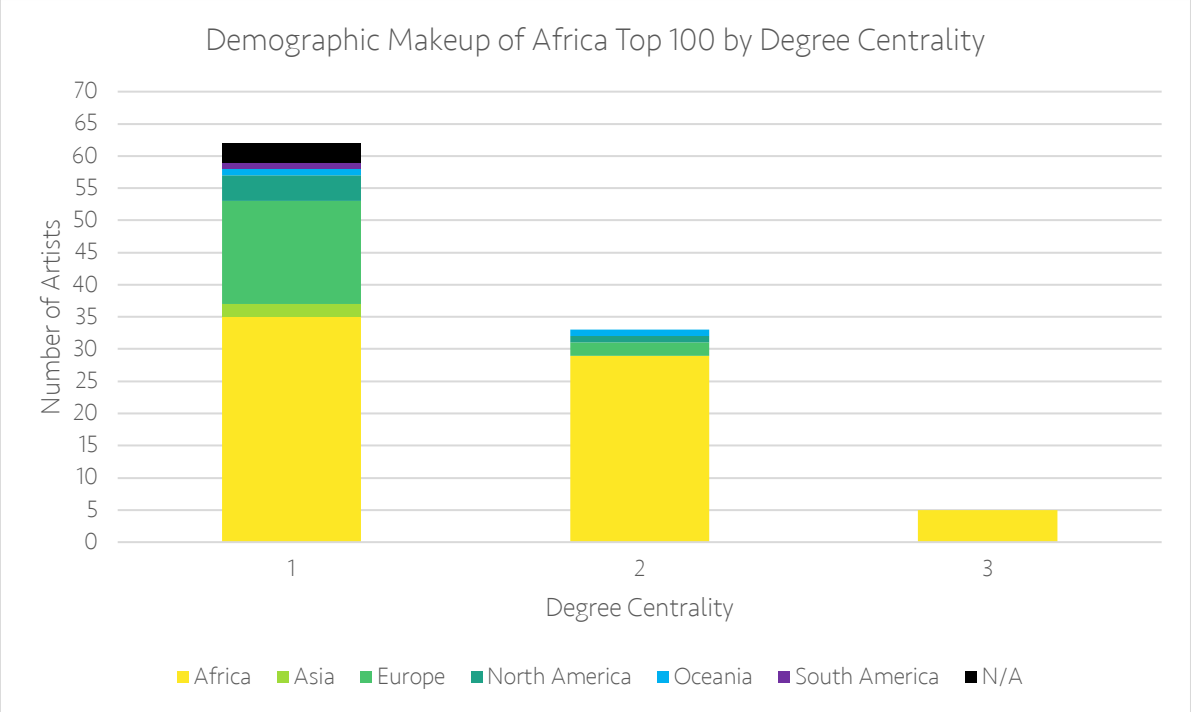

Figure 3.Demographic Makeup of the artists that enter the Africa Top 100.

African artists dominate the Africa Top 100 list by degree centrality. Amongst the artists with most shows played there are 69 African artists and the highest centrality category only contains local artists. The continents that follow are Europe with 18 artists, North America with 5 artists, Oceania with 2 artists, Asia with 2 artists, and South America with 1 artist. It is important to note that from these 69 African artists, 67 are from South Africa with the other two artists being from Zimbabwe and Mozambique. This shows that South African artists dominate the stages of the African festivals present in the subsample that was analysed. To place these two observations in context: that African artists

are well represented and that within this group it is mostly South African artists that excel, it is necessary to examine the network map of the subsampled African festival circuit (Figure 5).

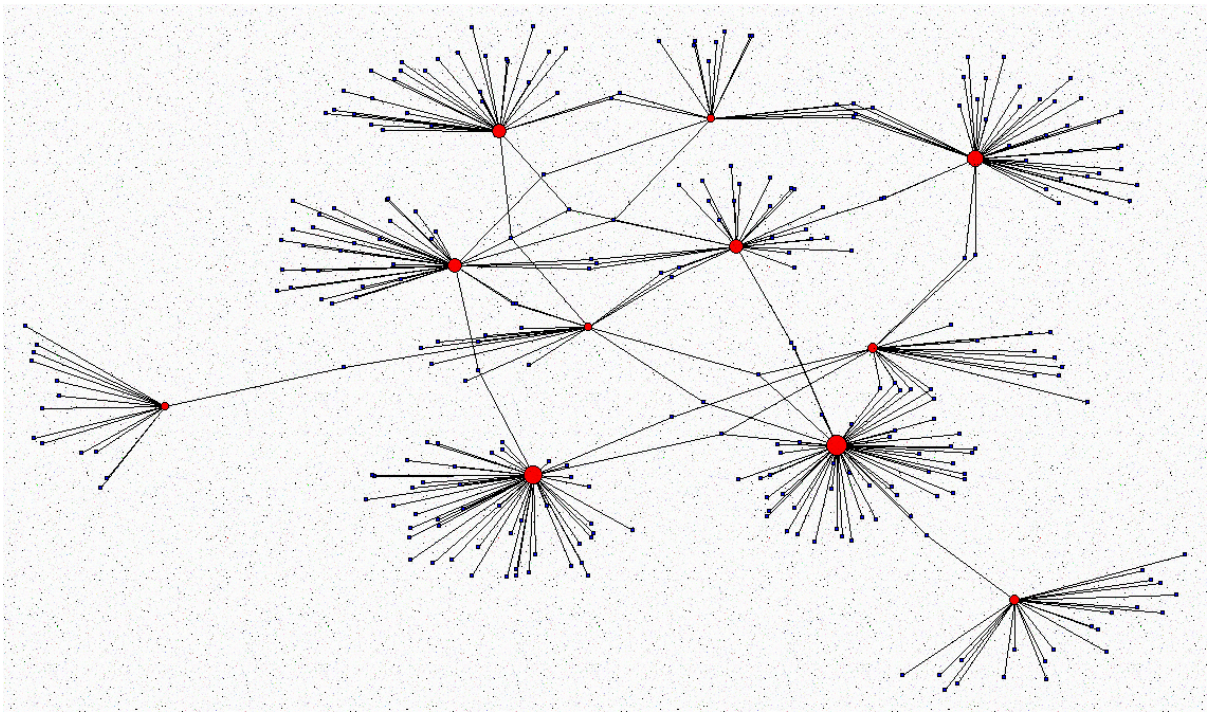

Figure 4.Network map of subsampled African festival circuit (labels omitted for clarity and node size set by degree centrality)

The first characteristic of this network is that it is well integrated. All festivals have booked at least one artist in common, with no festival having a completely unique lineup. From the 11 festivals in the subsample, 10 of them took place in South Africa and 1 of them, Fairground Festival, took place in Tunisia (see Appendix 3 for list of festivals in subsample). This is an important detail to consider when looking at the provenance of artists in the Africa Top 100. The fact that the vast majority of festivals in the subsample were held in South Africa may lead to (1) an upward bias in the centrality of South African artists and (2) a downward bias in the degree centrality of non-African artists. One reason for the upward bias in degree centrality of South African artists is that South African artists are in constant contact with the programmers, festival organisers, and other industry-insiders of South African festivals as they all form part of the electronic dance music scene of the country. Furthermore, festivals that programme big names usually give these famous artists the primetime slots towards the end of the day and book upcoming, hyperlocal talent from their immediate network to perform in the lead up to the bigger names. Since 10 of the festivals are held in South Africa, the vast majority of these opening acts are local South African DJs and live acts. In regard to the possible downward bias in the degree centrality of non-African artists, this may arise from the location of festivals in the subsample. A subsample that contained more festivals in Northern Africa, which is geographically closer to other parts of the world and thus booking non-African artists may be cheaper than booking non-African

artists in South African festivals, could have led to different results (i.e. lower African representation). The fact that the subsample is so skewed towards South African festivals is not a sampling error, but rather stems from the original dataset used for this study. In the full dataset, South Africa holds the largest share of electronic dance music festivals in the continent (86.36%) and this skewness was translated into the subsample through the simple random sampling process described in section 3b.

Having looked at which artists are booked by African festivals and succeed in the African festival circuit; we now centre on whether African artists are invited to play in festivals outside their continent. African artists appear three times in the Top 100 lists of other continents: commercial EDM DJ duo Aly & Fila (EG) appear in the Asia and the North America Top 100 list, and dance music duo Goldfish (SA) appear in the North America Top 100 list. This means that for every African artist that plays in foreign festivals and enters the Top 100 list of a foreign continent, there are 10.3 foreign artists which are invited to African festivals and enter the Africa Top 100 list by degree centrality (see Appendix 4). This points towards an unproportionate flow of artists from other parts of the world into Africa, while only a few African artists play outside their home continent.

Asia

Turning to the Asian festival circuit, we observe that 5 of the artists that entered the Asia Top 100 played three festivals, and the artists in this top tranche are all from countries outside Asia with 80% (n=4) being from Europe and 20% (n=1) being from North America. These five artists are Dimitri Vegas & Like Mike (BE), Moksi (NL), Salvatore Ganacci (SE), Valentino Khan (US), and Yellow Claw (NL). Amongst the 28 artists that played two festivals, 57.1% (n=16) are from Europe, 17.9% (n=5) are from Asia, 17.9% (n=5) are from North America, 3.6% (n=1) are from Oceania, and 3.6% (n=1) lacked nationality data. Moving down to the artists with the lowest degree centrality that entered the Asia Top 100, we observe that 38.8% (n=26) are from Europe, 32.8% (n=22) are from Asia, 16.4% (n=11) are from North America, 1.5% (n=1) are from Africa, 1.5% (n=1) are from Oceania, and 9% (n=6) have missing nationality data. As can be seen in Figure 6, European artists make up the majority of the Asia Top 100 with 46 artists, Asia follows with 27, North America with 17, Oceania with 2, and Africa with 1. Furthermore, we can see that the majority of local artists are in the lowest degree centrality category while foreign artists mostly occupy the middle and upper centrality categories.

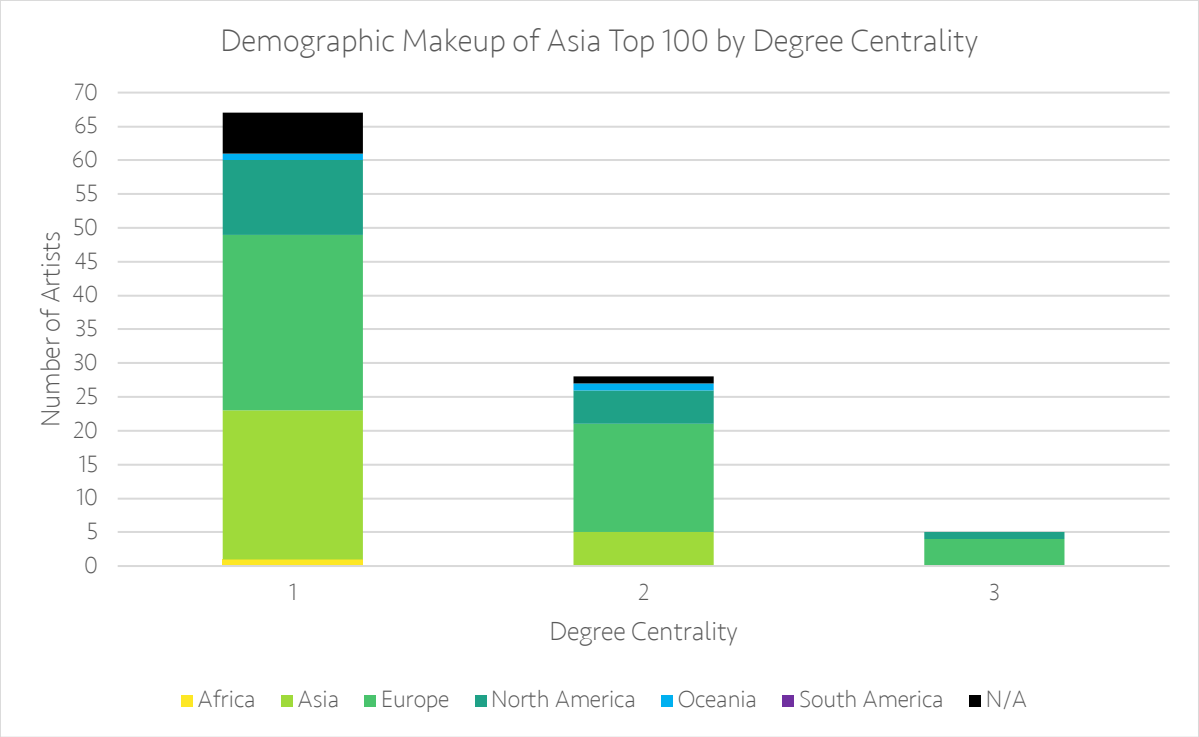

Figure 5.Demographic makeup of the artists that enter the Asia Top 100.

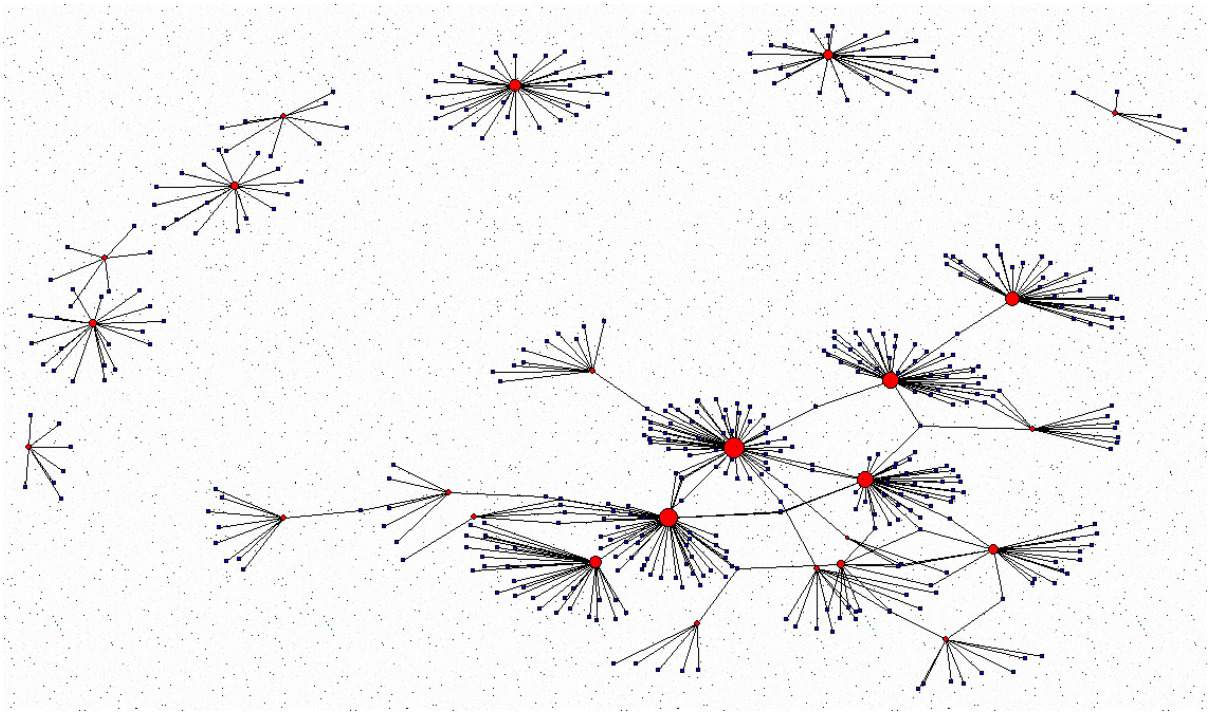

Figure 6.Network Map of subsampled Asian festival circuit (labels omitted for clarity and node size set by degree centrality)

We now turn to the 'outgoing' Asian artists: those that played in festivals outside Asia and entered the Top 100 list of another continent. There were 17 Asian artists that entered foreign Top 100 lists, with two of these artists entering the Top 100 lists of two continents for a total of 19 Asian entries abroad. In the Africa Top 100 list there are the psytrance artists Cylon (JP) and Blastoyz (IL), in the

Europe Top 100 list there are appearances by house/techno selector Peggy Gou (KR), contemporary techno artist DJ Nobu (JP), and Lebanese-British DJ/producer Nicole Moudaber (LB). In the North America Top 100 list there are appearances by Peggy Gou (KR), Infected Mushroom (IL), and Borgore (IL). In the Oceania Top 100 list Nicole Moudaber (LB) appears next to Japanese artist Dip in the Pool (JP). The South America Top 100 list is the one where Asian artist have the largest number of entries (excluding Asia itself) with Israeli artists Bliss (IL), Major 7 (IL), Undercover (IL), Vini Vici (IL), Berg (IL), Ritmo (IL), Vibe Tribe (IL), Astrix (IL), and Cosmic Tone (IL) making an appearance. For every Asian artist that appears in a foreign Top 100 list, there are 3.84 foreign artists that play in Asian festivals and enter the Asia Top 100 list by degree centrality. A noteworthy observation is that Israeli artists contributed the most to the success abroad of Asian artists. From the 17 Asian artists that entered foreign Top 100 lists, 12 are Israeli. This could be due to the central position of Israel in the world map, which makes it easier for Israeli artists to fly to Europe, Africa, and the eastern coast of the Americas in comparison to other Asian artists. Another factor which contributed to this result is the subgenre dimension. Israel is well-documented to be one of the leading countries in the production and consumption of Psytrance (St John, 2012), a subgenre of electronic dance music, and the presence of a large number of Psytrance-focused festivals in the festival subsample could partly explain why Israeli artists do so well in foreign Top 100 lists. In fact, from the 12 Israeli artists 11 can be classified as Psytrance artists and appear in Psytrance-specific festivals such as Rezonance Festival (SA), Sound Valley Festival (BR), XXXPerience (BR), Liquid Sky Festival (BR), and Balikali Festival (BR). It is important to point out the subgenre dimension of the subsample as it affects which artists make it into the Top 100 centrality lists. In this situation, the prominence of Israeli Psytrance artists combined with the presence of Psytrance festivals in the subsample may be presenting an overly positive image of how well Asian artists are represented in the worldwide festival circuit. In the absence of this group of Israeli psytrance acts, there would only be 5 Asian artists that enter foreign Top 100 lists and the foreign artist to local artist ratio for Asia would increase to 6.08.

Europe

In the European festival circuit, we observe that 2 of the artists in the Top 100 played six festivals and both the artists, Johnny 500 and Sub Zero Project, are from the Netherlands. In the five-festival degree centrality group there are 7 of the Top 100 artists, of which 85.7% (n=6) are from Europe and 14.3% (n=1) are from North America. In the following centrality category there are 33 artists, with 90.9% (n=30) being from Europe, 6.1% (n=2) from North America, and 3% (n=1) from Asia. Finally, the artists with the lowest degree centrality that entered the European Top 100 played three festivals each. 58 artists were in this category and the share of nationalities by continent are the following: 81% (n=47)

are from Europe, 10.3% (n=6) are from North America, 5.2% (n=3) are from South America, and 3.4% (n=2) are from Africa (Figure 8).

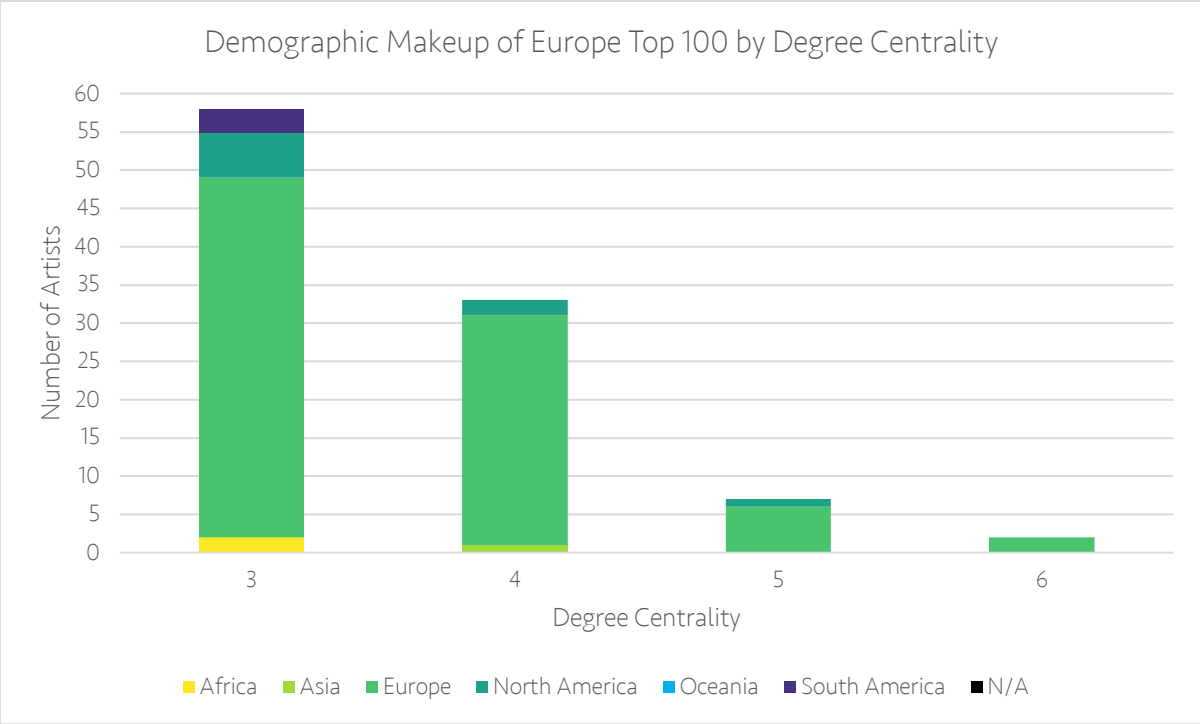

Figure 7.Demographic makeup of the artists that enter the Asia Top 100.

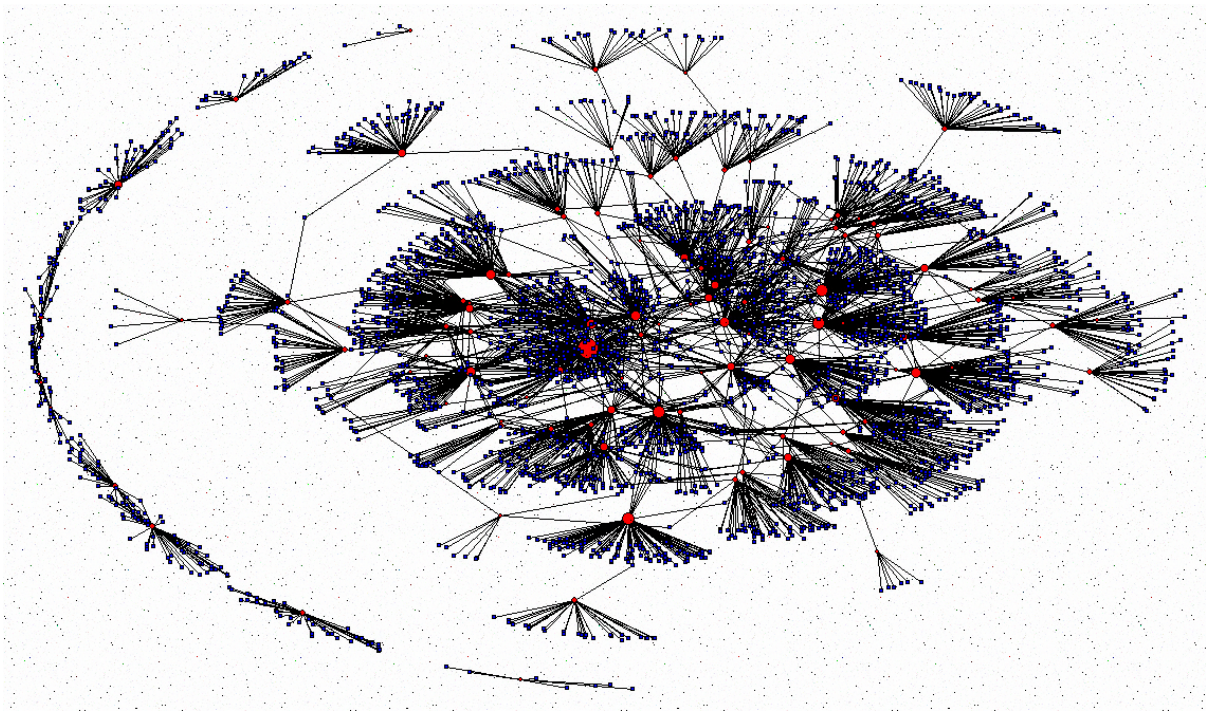

Figure 8.Network Map of subsampled European festival circuit (labels omitted for clarity and node size set by degree centrality).

Europe is the only continent that has a 'positive' foreign to local artists ratio by degree centrality (i.e. more European artists play abroad than foreign artists play in Europe). There are 153 European artists that played festivals outside Europe and entered the Top 100 lists of other continents, while only 15 non-European artists played European electronic dance music festivals and made it into the Europe Top 100 list (see Appendix 5). This means that for every non-European artist invited to European festivals and that entered the Europe Top 100 there were a little over 10 European artists that played abroad and entered foreign Top 100 lists (see Appendix 4). These findings are in line with studies on artist representation in other artistic fields which highlight western domination and Eurocentrism (see Buchholz & Wuggenig, 2005). The reasons for this large number of European artists finding success abroad, while non-European artists succeeding in Europe are rare cases, are numerous. Audience preferences may nudge bookers in different parts of the world to invite European artists, festival organisers may find that programming European acts leads to better ticket sales, the centrality of Europe's transport infrastructure makes it easier for European artists to mobilise, and so on. The possible factors are plentiful and deserve a thorough study, so this paper restricts itself to simply presenting the artist representation in the electronic dance music festival circuit.

North America

In the North American festival circuit, we observe that 3 artists in the Top 100 played five festivals. These artists were Claude VonStroke, J. Phlip, and Josh Wink, all from the United States. In the four-festival degree centrality category there were 5 artists of which 80% (n=4) are from Europe and 20% (n=1) are from North America. Moving down in degree centrality to the artists that performed in three North American festivals, we find that 47.1% (n=16) are from North America, 41.2% (n=14) are from Europe, 5.9% (n=2) are from Asia, 2.9% (n=1) are from Africa, and 2.9% (n=1) are from Oceania. In the final category we find artists that performed in two North American festivals, of which 67.2% (n=39) are from North America, 22.4% (n=13) are from Europe, 3.4% (n=2) are from Oceania, 1.7% (n=1) are from Africa, 1.7% (n=1) are from Asia, 1.7% (n=1) are from South America, and 1.7% (n=1) have missing nationality data (Figure 10).

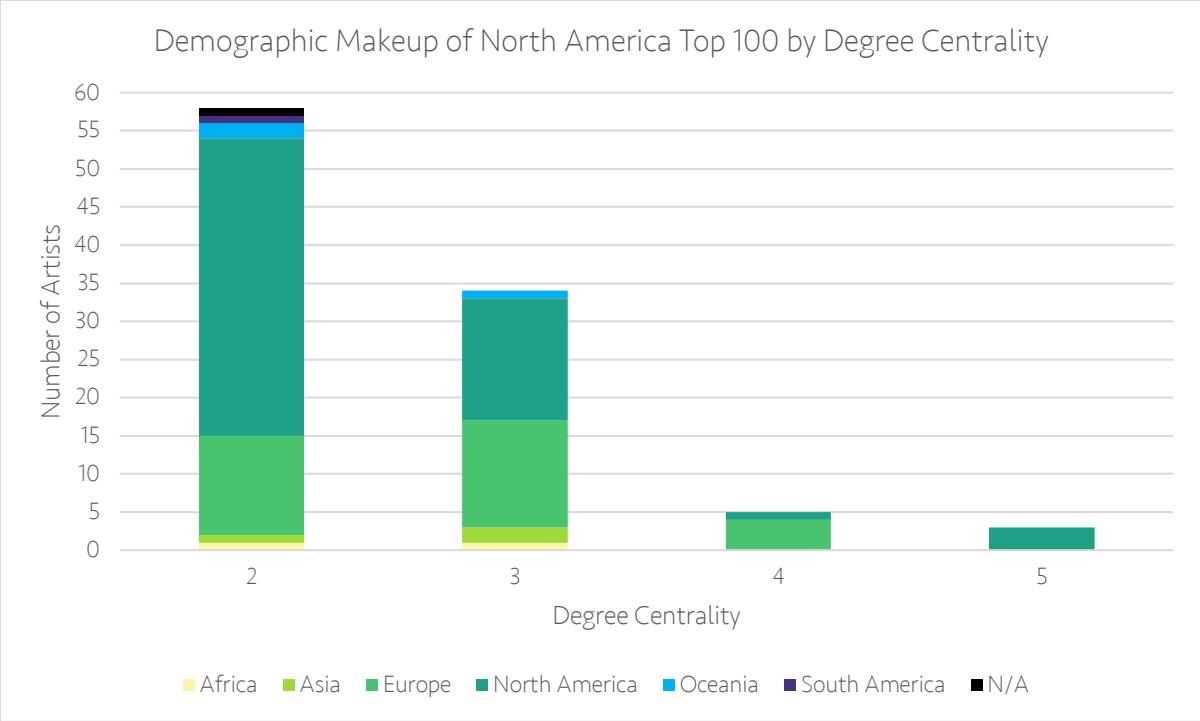

Figure 9.Demographic Makeup of the artists that entered the North America Top 100.

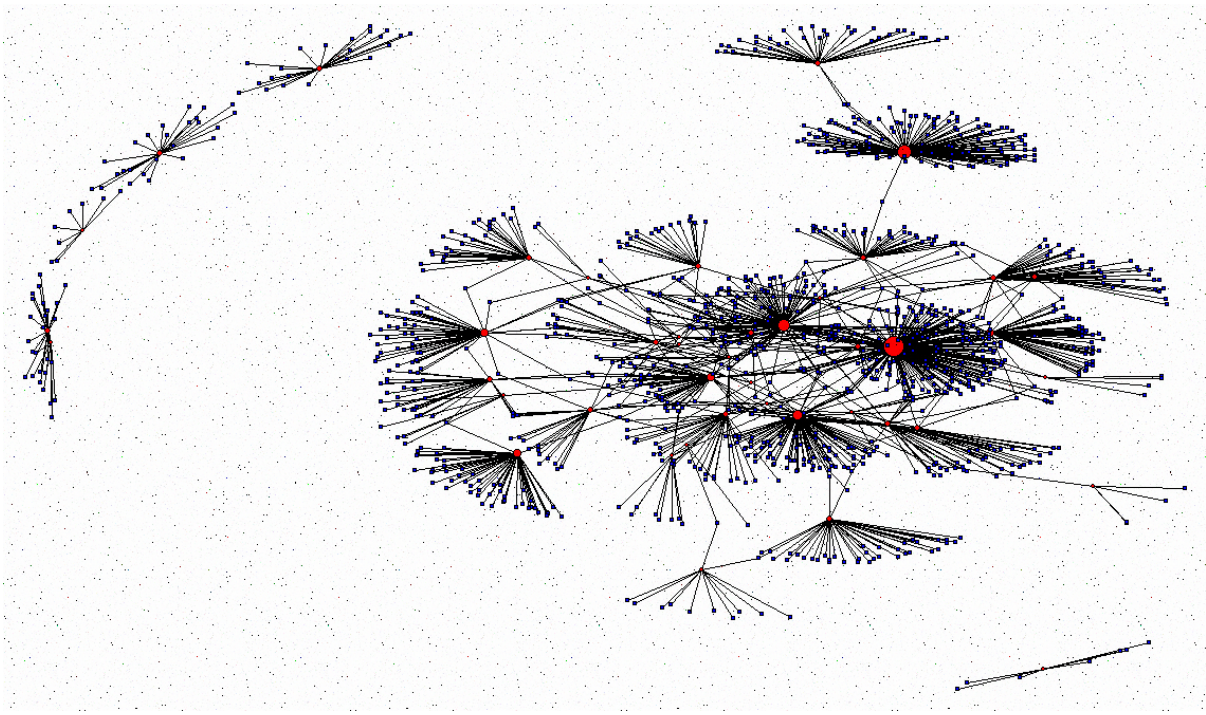

Figure 10.Network Map of subsampled North American festival circuit (labels omitted for clarity and node size set by degree centrality).

With 45 North American artists in foreign Top 100 lists, North America had the second highest number of 'outgoing' artists after Europe. One key difference with Europe, however, was the higher number of foreign artists invited by North American festivals and who made it to the Top 100 list of the continent. There were 40 appearances by foreign artists in the North America Top 100, which

equates to an artist 'export-import' ratio of 1.125 meaning that for every foreign artist that entered the North America Top 100 there was a little over 1 North American artist that entered foreign Top 100 lists (Appendix 4).

Oceania

In the Oceanian festival circuit, we observe that 2 artists that entered the Oceania Top 100 played three festivals and the artists in this top tranche are all from Oceania, with both Fantastic Man (AU) and Millú (AU) coming from Australia. Amongst the artists that played two festivals, 61.5% (n=8) are from Oceania, 15.4% (n=2) are from Europe, 15.4% (n=2) are from North America, and 7.7% (n=1) are from Asia. In the bottom centrality category there are 85 artists of which 47.1% (n=40) are from Oceania, 40% (n=34) are from Europe, 9.4% (n=8) are from North America, 2.4% (n=2) are from South America, and 1.2% (n=1) are from Asia (Figure 12).

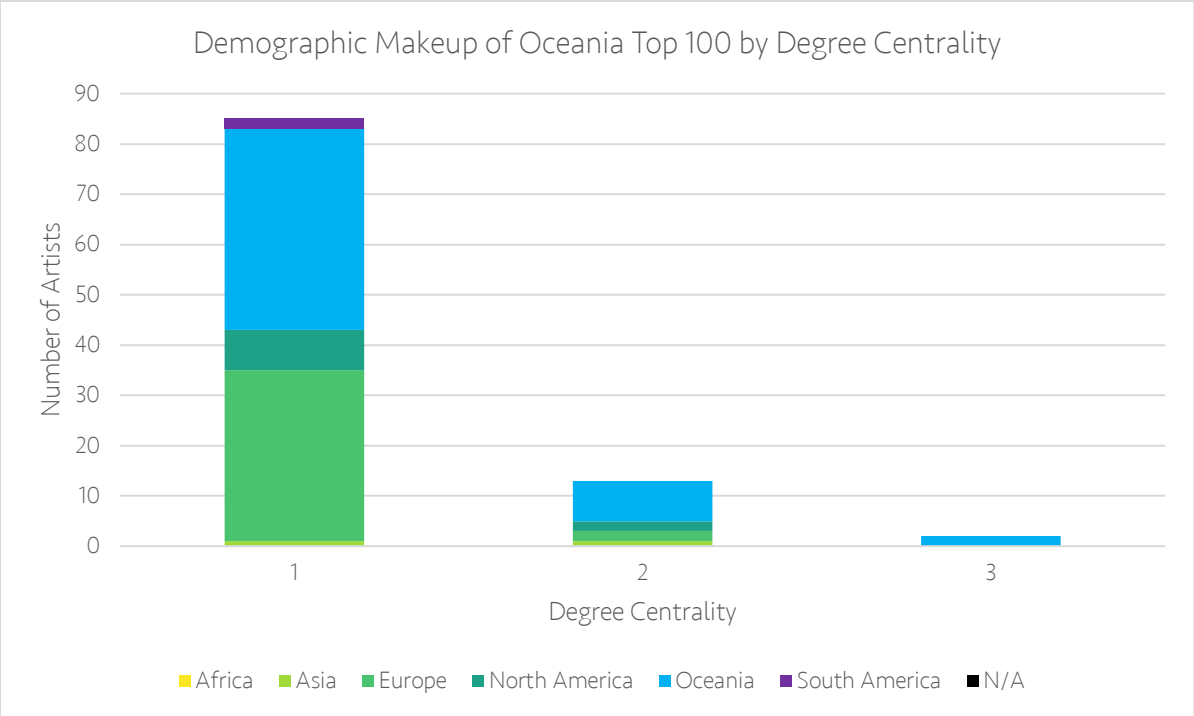

Figure 11.Demographic Makeup of artists that entered the Oceania Top 100.

With a large number of foreign artists entering the Oceania Top 100 list and a low number of Oceanian artists entering the Top 100 list of other continents, the continent has one of the lowest 'export-import' ratios (ratio=0.14, second only to Africa).

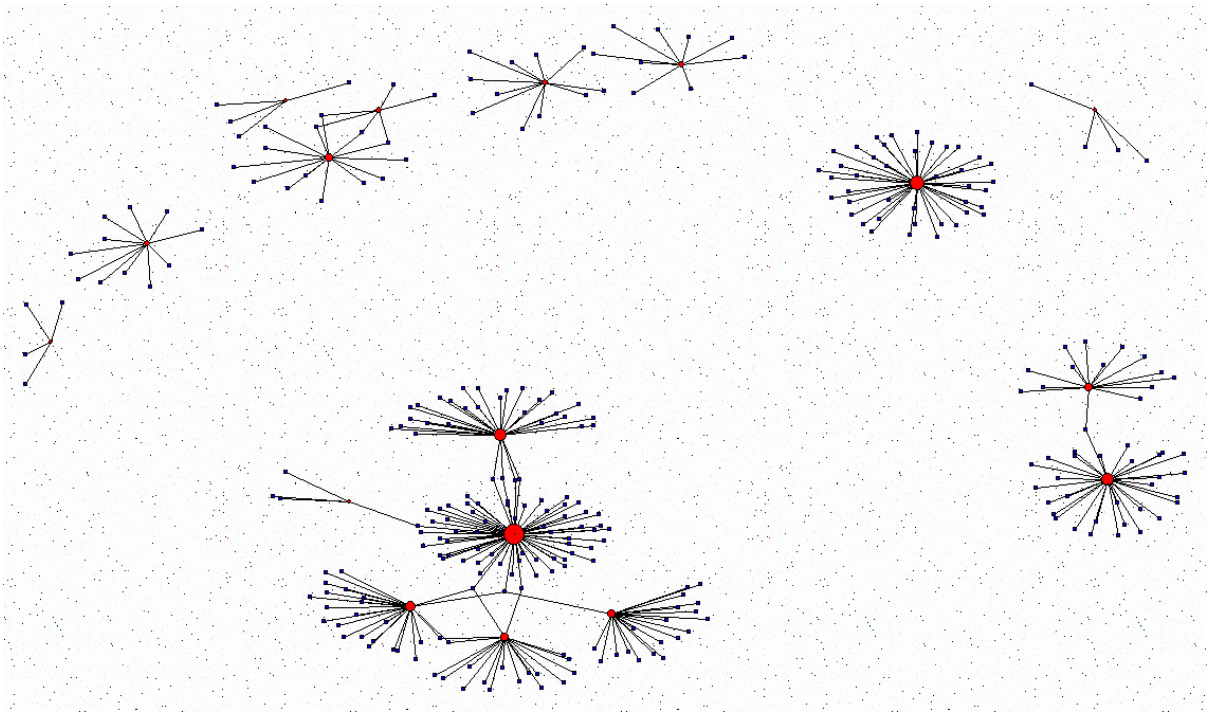

Figure 12.Network Map of subsampled Oceanian festival circuit (labels omitted for clarity and node size set by degree centrality).

South America

Finally, in South America the most central artists by degree centrality performed in four festivals throughout 2018 and represented 3% (n=3) of the South America Top 100. These three artists at the top of the degree centrality ranking were Becker (BR), Groove Delight (BR), and Gustavo Mota (BR), and are all from Brazil. There were 12 artists that performed in three festivals throughout the region of which 41.7% (n=5) are from South America, 33.3% (n=4) are from Asia, and 25% (n=3) are from Europe. Artists who had a degree centrality of 2 were 24, with 62.5% (n=15) coming from South America, 20.8% (n=5) from Europe, 12.5% (n=3) from Asia, and 4.2% (n=1) from North America. At the lowest tranche of degree centrality were 61 artists. From these artists 62.3% (n=38) are from South America, 23% (n=14) are from Europe, 4.9% (n=3) are from North America, 3.3% (n=2) are from Asia, and 6.6% (n=4) have missing nationality data (Figure 14). For every South American artist that entered the Top 100 list of other continents, 5 foreign artists entered the South America Top 100 list.

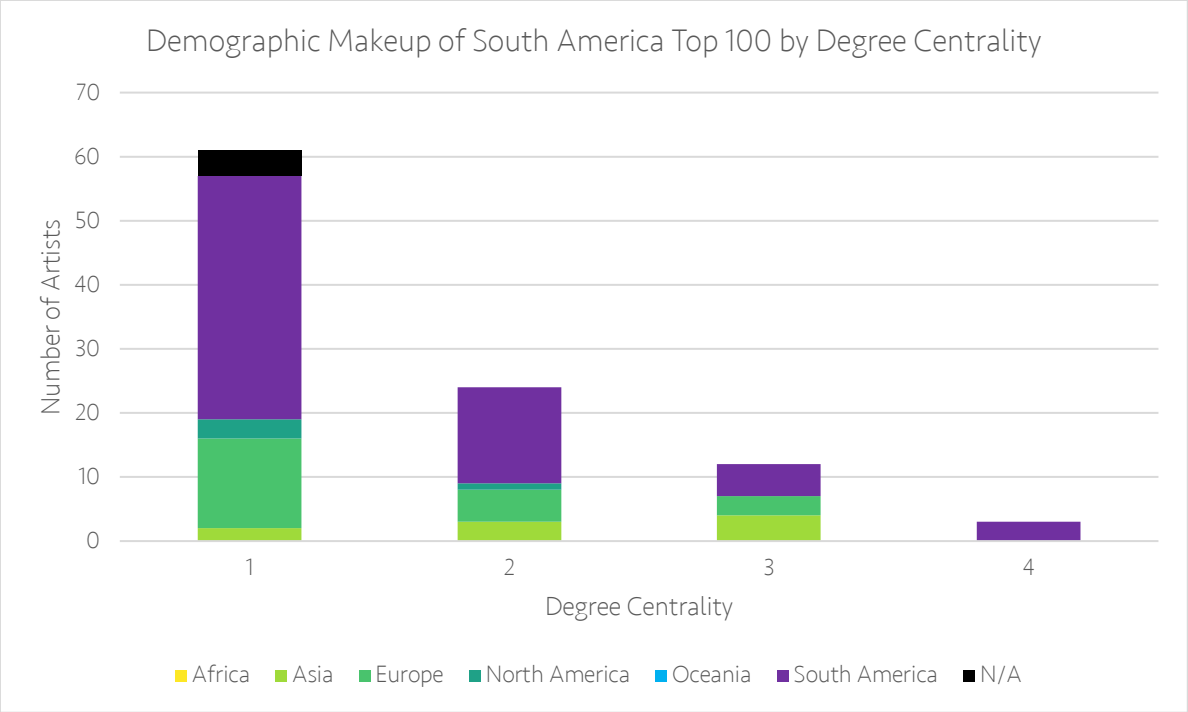

Figure 13.Demographic Makeup of artists that entered the South America Top 100.

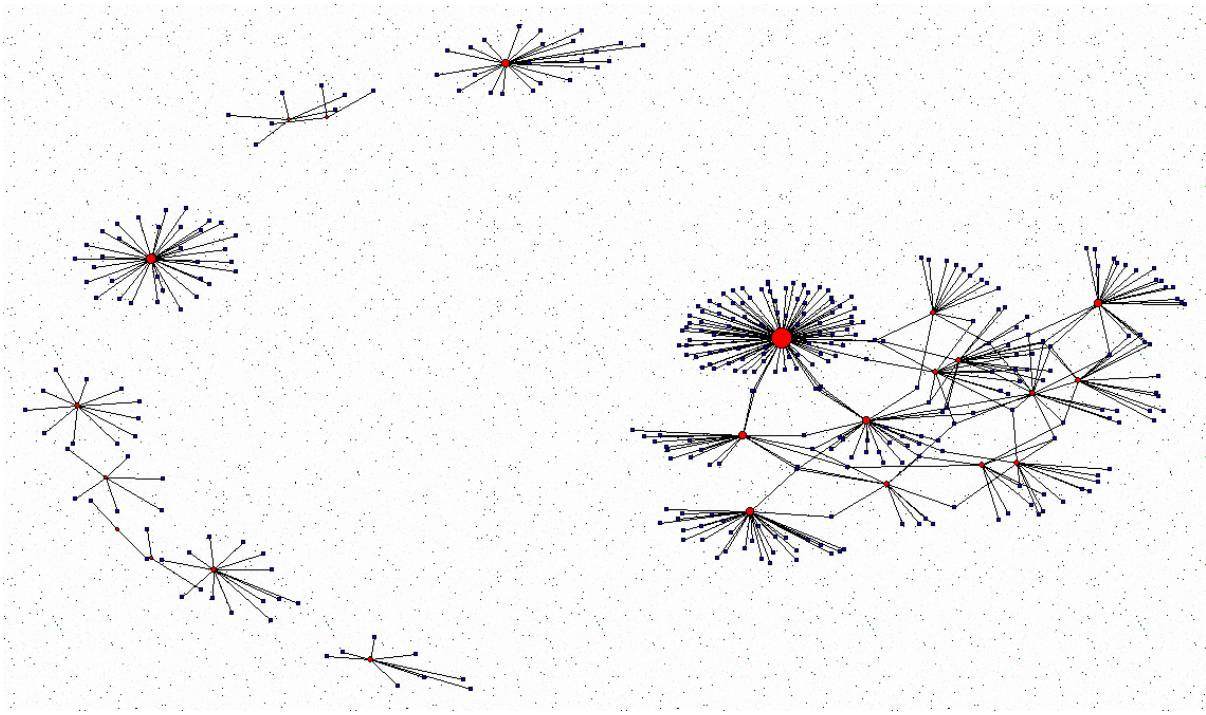

Figure 14. Network Map of subsampled South American festival circuit (labels omitted for clarity and node size set by degree centrality).

4.1.2 Superstars

The evidence is mixed in regard to whether artists from a certain geographic region occupy more central spots in the world's festival circuits according to degree centrality. As shown by the outgoing to incoming artist ratios, European artists are the most successful followed by their North American peers. When these ratios are decomposed into individual countries, we find further evidence that artists from European and Western offshoot countries have the most appearances in the world's festival circuits (Figure 16). Artists from other regions were not as successful abroad, however, to varying degree, they were able to achieve success in their own region.

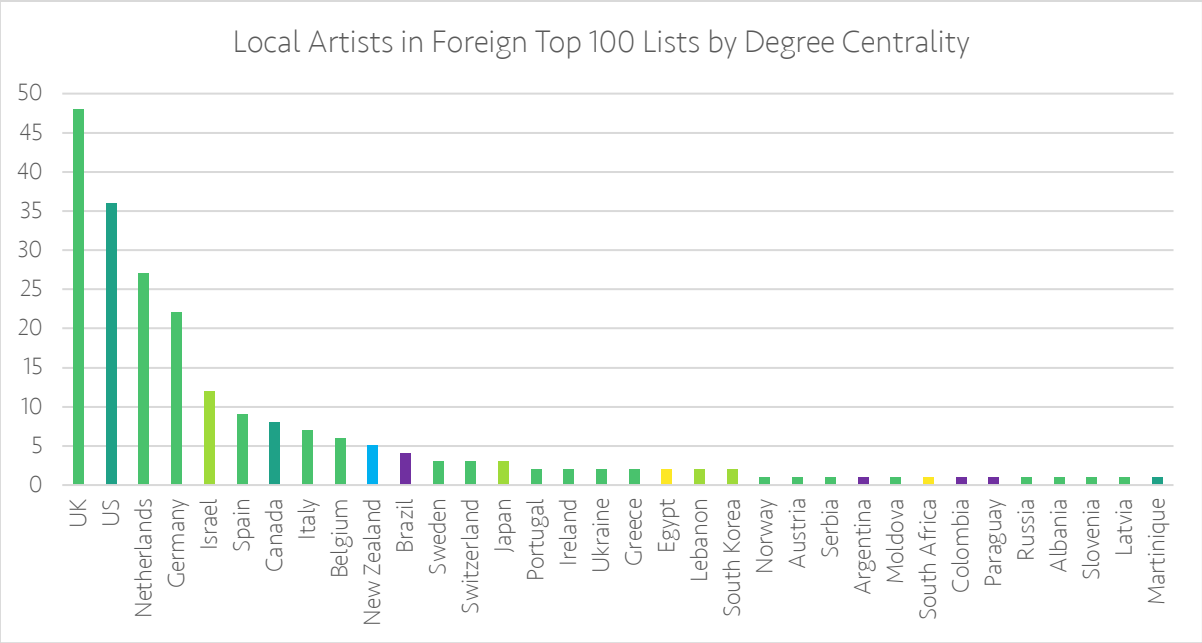

Figure 15.Countries with most entries in foreign Top 100 lists (colour-coded by continent).

In Africa and in South America, we have found that the majority of artists in the Top 100 lists by degree centrality were local artists (69 out of 100 for Africa and 61 out of 100 for South America as can be seen in Figure). In Asia, on the other hand, the number of local artists in the same list was 27, with more European artists having high degree centrality (46 artists in the Top 100 list). Here it becomes important to note that the threshold for saying that a certain group of artists is fairly represented is subjective. Should African electronic dance music festivals have an all-African lineup? That would be unrealistic and detrimental to the development of a truly global, multicultural festival circuit. Should the cut-off then be placed at a 50-50 split between local artists and artists from other parts of the world? It is difficult to discern the reasons why a 50-50 split would be better than a 40-60 or 25-75 split.

At this point, in order to be able to draw a clearer picture, it becomes interesting to analyse the group of artists with 'superstar' status. These are the artists that entered the Top 100 list of more than one continent and thus enjoy international fame across the world – this is the category where the

consecrated artists and hot new trends of the electronic dance music world sit in. At the very top of this category we find Âme (DE), a German duo who alternate DJ sets with live electronic music performances and are present in the Top 100 list of four continents: Africa, Europe, North America, and South America. Next in the pecking order are Armin van Buuren (NL), Axwell Λ Ingrosso (SE), DJ Tennis (IT), and Dubfire (US), all present in the Top 100 lists of three continents. Finally, there are 25 artists that entered the Top 100 list of two continents including acts such Floating Points (UK), Peggy Gou (KR), Carl Cox (UK), Hardwell (NL), and Dennis Cruz (ES). From these thirty artists in the 'superstar' group, 66.7% (n=20) are from Europe, 16.7% (n=5) are from North America, 13.3% (n=4) are from Asia, and 3.3% (n=1) are from Africa (see Table 4). This is an important finding as it elucidates from which regions the artists that are at the very top of the world stage of electronic dance music are.

Table 4. Superstar artists (present in the Top 100 lists of at least two continents).

Artist	Country of Origin	Continent of Origin	Number of Top 100 Appearances
Âme	Germany	Europe	4
Armin van Buuren	Netherlands	Europe	3
Axwell Λ Ingrosso	Sweden	Europe	3
DJ Tennis	Italy	Europe	3
Dubfire	US	North America	3
Aly & Fila	Egypt	Africa	2
Blastoyz	Israel	Asia	2
Bliss	Israel	Asia	2
Peggy Gou	South Korea	Asia	2
Nicole Moudaber	Lebanon	Asia	2
Reality Test	Germany	Europe	2
Moksi	Netherlands	Europe	2
Dirtcaps	Netherlands	Europe	2
Eats Everything	UK	Europe	2
Ferry Corsten	Netherlands	Europe	2
Afrobros	Netherlands	Europe	2
Carl Cox	UK	Europe	2
Fedde le Grand	Netherlands	Europe	2
Hardwell	Netherlands	Europe	2
Jamie Jones	UK	Europe	2
Ben UFO	UK	Europe	2
Deadly Guns	Netherlands	Europe	2
Dennis Cruz	Spain	Europe	2
Floating Points	UK	Europe	2
Cesqeaux	Netherlands	Europe	2
D-fence	Netherlands	Europe	2
Cash Cash	US	North America	2
KSHMR	US	North America	2
4b	US	North America	2
Carl Craig	US	North America	2

4.2 Eigenvector Centrality

4.2.1 Overview of Eigenvector Centrality Scores

Upon examination of the eigenvector scores, we find a unipolar trend in the programming choices of festivals throughout the world that is similar to the one found with degree centrality. The per-continent results by eigenvector scores and their artist-nationality decomposition are presented in Table 5. Throughout the six Top 100 lists by eigenvector centrality there were 573 unique artists, of which 13 have missing nationality data thus there remain 560 artists whose centrality position can be used to discuss geographic representation.

The histograms in Appendix 6 show that for Africa, Asia, Oceania, and South America, there is a clear difference in eigenvector scores between artists who are at the core of the network (i.e. have high eigenvector scores) and those that are at the periphery of the network (i.e. have low eigenvector scores). This is evidenced by the distribution of the eigenvector scores which are found either to the right or the left of the mean, with few to no observations having mean eigenvector scores. This is due to the clear divide between core and peripheral festivals in these continents, with the core and the periphery booking almost no artists in common. In Europe and North America on the other hand, a right-skewed distribution of eigenvector scores can be discerned – possibly due to the higher number of links between festivals in these regions, which decrease the likelihood of a completely severed core and periphery.

Unlike degree centrality, which is given by a number equal to the festival performances of an artist, eigenvector centrality scores are not comparable across regions since they are relative and are calculated through the connections of artists within a region. Thus, we cannot say that the artist with the highest eigenvector score in Africa (EIG=0.179) has a higher eigenvector centrality than that in Asia (EIG=0.166) as these scores were calculated through a different set of relations. Because of this, Table 5 shows the eigenvector centrality per-continent results not in groupings of absolute eigenvector scores, but rather by how far away from the continent's mean eigenvector score an artist is (i.e. the number of standard deviations from the mean). Artists with 'very low' eigenvector centrality were defined as those whose eigenvector centrality fell under the mean by more than one standard deviation. Artists with 'low' centrality were defined as those that had an eigenvector score that fell within the first standard deviation under the continent's mean. Artists with 'high' centrality were defined as those that had an eigenvector score that fell within the first standard deviation above the

continent's mean, and artists with 'very high' centrality were defined as those that had an eigenvector score that was above the continent mean by at least one standard deviation. The per-continent results are presented below.

Table 5. Share of Artists by Eigenvector Centrality based on Top 100 list

Eigenvector Centrality Range	Host Continent						By Continent of Origin	Host Continent					
	Africa	Asia	Europe	North America	Oceania	South America		Africa	Asia	Europe	North America	Oceania	South America
≥μ+σ (Very high)	10	6	18	22	0	0	Africa	100,0%	0,0%	0,0%	0,0%	0,0%	0,0%
							Asia	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
							Europe	0,0%	83,3%	100,0%	54,5%	0,0%	0,0%
							North America	0,0%	16,7%	0,0%	45,5%	0,0%	0,0%
							Oceania	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
							South America	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
							N/A	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
<μ+σ, ≥μ (High)	44	50	11	14	66	93	Africa	56,8%	0,0%	0,0%	0,0%	0,0%	1,1%
							Asia	6,8%	54,0%	0,0%	7,1%	0,0%	0,0%
							Europe	29,5%	20,0%	90,9%	50,0%	39,4%	12,9%
							North America	4,5%	10,0%	9,1%	42,9%	13,6%	3,2%
							Oceania	0,0%	0,0%	0,0%	0,0%	43,9%	1,1%
							South America	0,0%	0,0%	0,0%	0,0%	3,0%	78,5%
							N/A	2,3%	16,0%	0,0%	0,0%	0,0%	3,2%
<μ, ≥μ-σ (Low)	4	2	60	64	0	0	Africa	100,0%	0,0%	0,0%	0,0%	0,0%	0,0%
							Asia	0,0%	0,0%	0,0%	3,1%	0,0%	0,0%
							Europe	0,0%	50,0%	91,7%	51,6%	0,0%	0,0%
							North America	0,0%	50,0%	6,7%	39,1%	0,0%	0,0%
							Oceania	0,0%	0,0%	0,0%	1,6%	0,0%	0,0%
							South America	0,0%	0,0%	1,7%	3,1%	0,0%	0,0%
							N/A	0,0%	0,0%	0,0%	1,6%	0,0%	0,0%
<μ-σ (Very Low)	42	42	11	0	34	7	Africa	92,9%	0,0%	9,1%	0,0%	0,0%	0,0%
							Asia	0,0%	64,3%	0,0%	0,0%	0,0%	42,9%
							Europe	4,8%	28,6%	90,9%	0,0%	26,5%	28,6%
							North America	0,0%	4,8%	0,0%	0,0%	5,9%	0,0%
							Oceania	2,4%	2,4%	0,0%	0,0%	67,6%	0,0%
							South America	0,0%	0,0%	0,0%	0,0%	0,0%	28,6%
							N/A	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%

Africa

In the African festival circuit, the most central artists were from African countries. Ten artists in the Africa Top 100 have 'very high' centrality and are all from South Africa, these are Tersius, Room Mush, Broken Toy, Dave Mac, iTone, Josh Mac, Nordic, Skitzo, D-Ranged, and Venture. One category below we find 44 artists with 'high' degree centrality. From these, 56.8% (n=25) are from an African country, 29.5% (n=13) are from a European country, 6.8% (n=3) are from an Asian country, 4.5% (n=2) are from a North American country, and 2.3% (n=1) have no nationality data. Under the mean we first find 4 artists with 'low' centrality and who are all from Africa, while in the bottom category there are 42 artists with 'very low' centrality of which 92.9% (n=39) are from Africa, 4.8% (n=2) are from Europe, and 2.4% (n=1) are from Oceania.

There is an increase in the presence of African artists in the Africa Top 100 when centrality is based on eigenvector scores instead of degree centrality with the number of African artists in the Africa Top 100 is 78 by eigenvector, while it was 69 by degree. This difference comes from a number of foreign artists dropping out of the Top 100 since they were programmed by festivals that are considered peripheral in the eigenvector calculations (e.g. the four foreign artists booked by Electric Circus Festival who enter the Africa Top 100 by degree of centrality are not in the Top 100 by eigenvector, due to Electric Circus Festival's low eigenvector score; see Appendix 3). On the other hand, many foreign artists tied to the most central festival by eigenvector score, Rezonance Festival, who were not in the Top 100 by degree centrality, enter the Africa Top 100 by eigenvector score. Overall, of the 21 foreign artists that entered the Top 100 by degree centrality many made their entry by playing at non-central festivals in Africa.

The number of entries by African artists in foreign Top 100 lists decreased to 2 compared to the Top 100 list by degree centrality, with Loco Dice (TN) appearing in the Europe Top 100 and Regan (SA) appearing in the South America Top 100. Both Aly & Fila (EG) and Goldfish (SA), the African artists that had entered the foreign degree centrality lists, have now dropped out. This means that the eigenvector export-import ratio has increased from 10.3 to 10.5 (a 'worsening' in the representation of African artists when taking into account the importance of the festivals they play at).

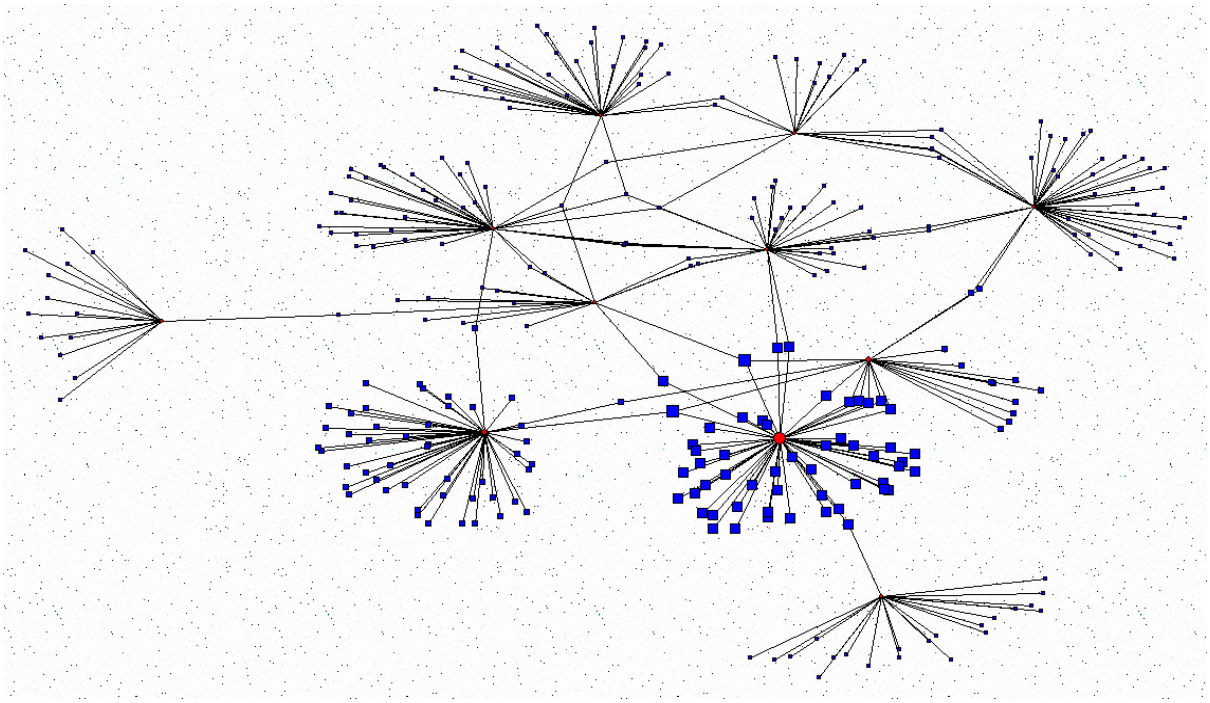

Figure 16. Network map of the African electronic dance music festival circuit (labels omitted for clarity and node size set by eigenvector score).

Asia

In the Asia Top 100, 6 of the artists have 'very high' centrality. As was the case with the top artists by degree centrality, all artists in the highest category of eigenvector scores are not Asian artists. From the 6 artists with 'very high' centrality, 83.3% (n=5) are European and 16.7% (n=1) are North American. In the 'high' centrality category there are 50 artists, with 54% (n=27) of these coming from Asia, 20% (n=10) coming from Europe, 10% (n=5) coming from North America, and 16% (n=8) having missing nationality data. Artists with 'low' centrality are only 2, with one artist coming from Europe and the other coming from North America. In the bottom eigenvector centrality category of artists that performed in the Asian festival circuit there are 42 artists, of which 64.3% (n=27) are Asian, 28.6% (n=12) are European, 4.8% (n=2) are North American, and 2.4% (n=1) are Oceanian.

The number of Asian entries in the Asia Top 100 increased considerably with respect to the Top 100 list by degree centrality, going from 27 to 54 while European entries decreased from 45 to 27 and North American entries decreased from 17 to 10 – meaning that Asian artists are more central in the Asian festival circuit by eigenvector score than by degree centrality since the festivals they play in Asia are usually central festivals. On the other hand, the number of 'outgoing' Asian artists that entered foreign Top 100 lists decreased from 19 to 9. The artists that drop out of foreign Top 100 lists are Peggy Gou (KR), DJ Nobu (JP), Nicole Moudaber (LB),

Borgore (IL), Dip in the Pool (JP), Major 7 (IL), Ritmo (IL), Vibe Tribe (IL), Astrix (IL), and Cosmic Tone (IL). One thing these artists have in common is that they play at festivals which have low centrality by eigenvector scores amongst the festivals present in the subsample. For example, although Peggy Gou (KR) appears in 4 festivals in Europe (Spring Attitude Festival, Awakenings x ADE, Nuits Sonores, Defected – Croatia) the artist does not make an entry into the Europe Top 100 list by eigenvector scores (see Appendix 3 for eigenvector scores).[1]

With this decrease in foreign entries in the Asia Top 100 list and the decrease in Asian entries in foreign Top 100 lists, there are now 5.11 foreign entries in the Asia Top 100 for every Asian entry in foreign Top 100s lists. This amounts to a lower visibility of Asian artists once festival centrality is taken into account, as the ratio under degree centrality was of 3.84.

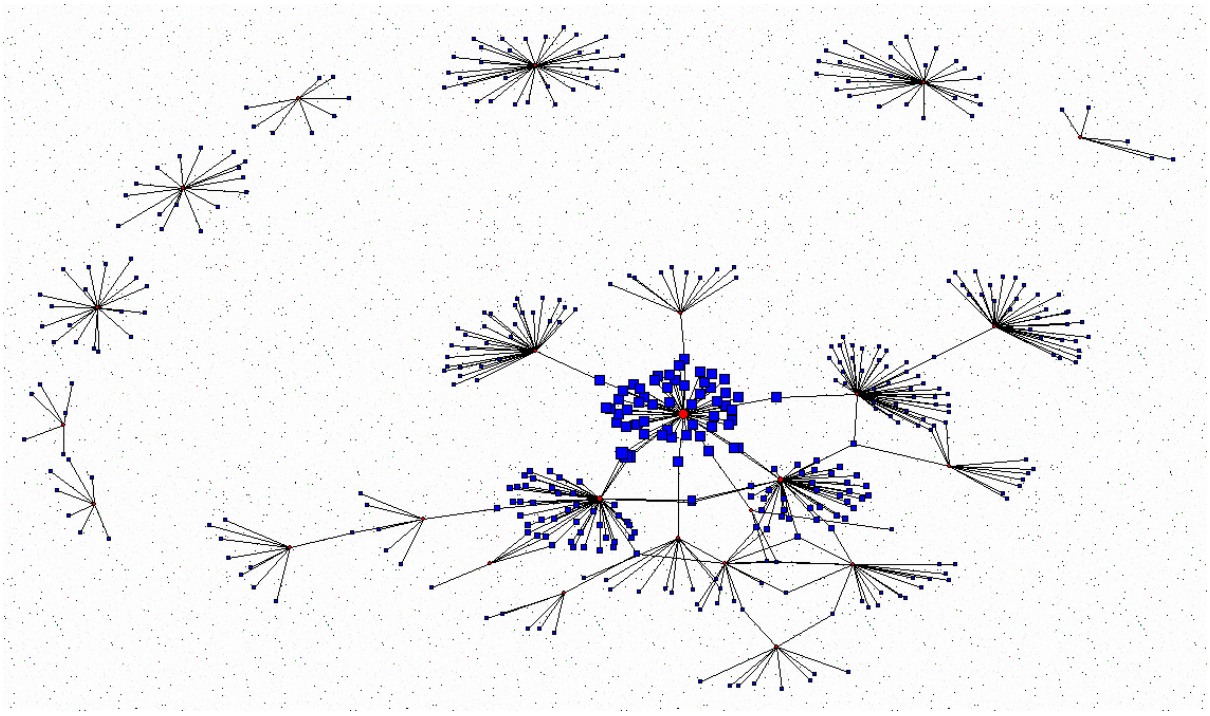

Figure 17. Network Map of the Asian electronic dance music festival circuit (labels omitted for clarity and node size set by eigenvector score).

Europe

In Europe there are 18 artists with 'very high' eigenvector centrality, all of whom are European. In the 'high' eigenvector score category there are 11 artists, with 90.9% (n=10) coming from Europe and 9.1% (n=1) coming from North America. Under the mean, the artists

[1] Though Peggy Gou (KR) can actually be considered amongst the most in-demand DJs in the world right now, it must be kept in mind that this result is due to the festivals included in the subsample and how they relate to each other.

with 'low' eigenvector centrality are 60, of which 91.7% (n=55) are European, 6.7% (n=4) are North American, and 1.7% (n=1) are South American. The artists within the bottom category with 'very low' eigenvector scores in the European festival circuit are 11, of which 90.9% (n=10) are European and 9.1% (n=1) are African.

The number of European entries in foreign Top 100 lists decreased from 153 to 144, meaning that, for each entry by a foreign artist in the European Top 100, there were 20.57 European artists who played abroad. Thus, when festival centrality is accounted for, the ratio of representation tilts more in favour of European artists, as under degree centrality the ratio was of 10.2, providing further evidence for the overrepresentation of European artists in the world festival circuit.

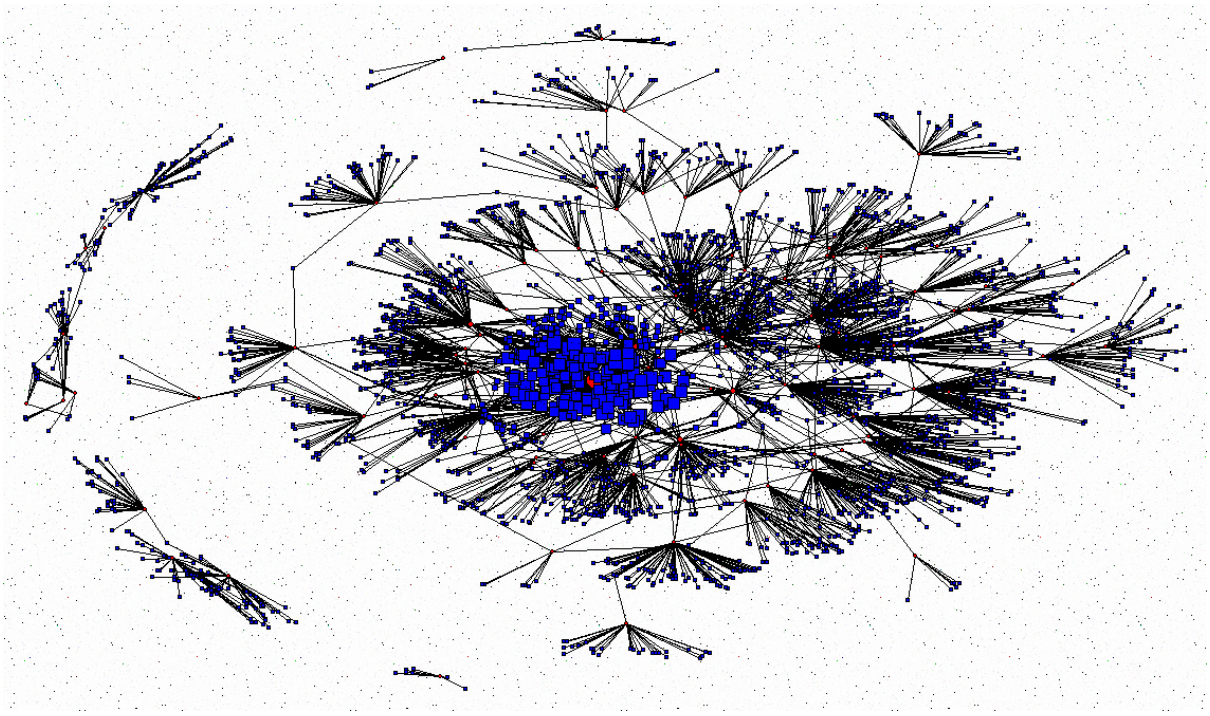

Figure 18. Network Map of the European electronic dance music festival network (labels omitted for clarity and node size set by eigenvector score).

North America

In North America 22 artists have 'very high' eigenvector scores. Of these artists, 54.5% (n=12) are from Europe and 45.5% (n=10) are from North America. In the 'high' centrality category, there are 14 artists with 50% (n=7) coming from European countries, 42.9% (n=6) coming from North American countries, and 7.1% (n=1) coming from Asian countries. Below the mean eigenvector score there are 64 artists, and all of these belong to the 'low' centrality category with no artists in the 'very low' centrality category. From these 64 artists, 51.6% are

European, 39.1% (n=25) are North American, 3.1% (n=2) are Asian, 3.1% (n=2) are South American, 1.6% (n=1) are Oceanian, and 1.6% (n=1) have missing nationality data.

On the other hand, 'outgoing' North American artists decreased from 45 to 30 under eigenvector scores. Thus, the artist export-to-import ratio for the continent decreases from 1.25 to 0.52, meaning that for every North American entry in foreign Top 100 lists there are 2 foreign entries in the North America Top 100.

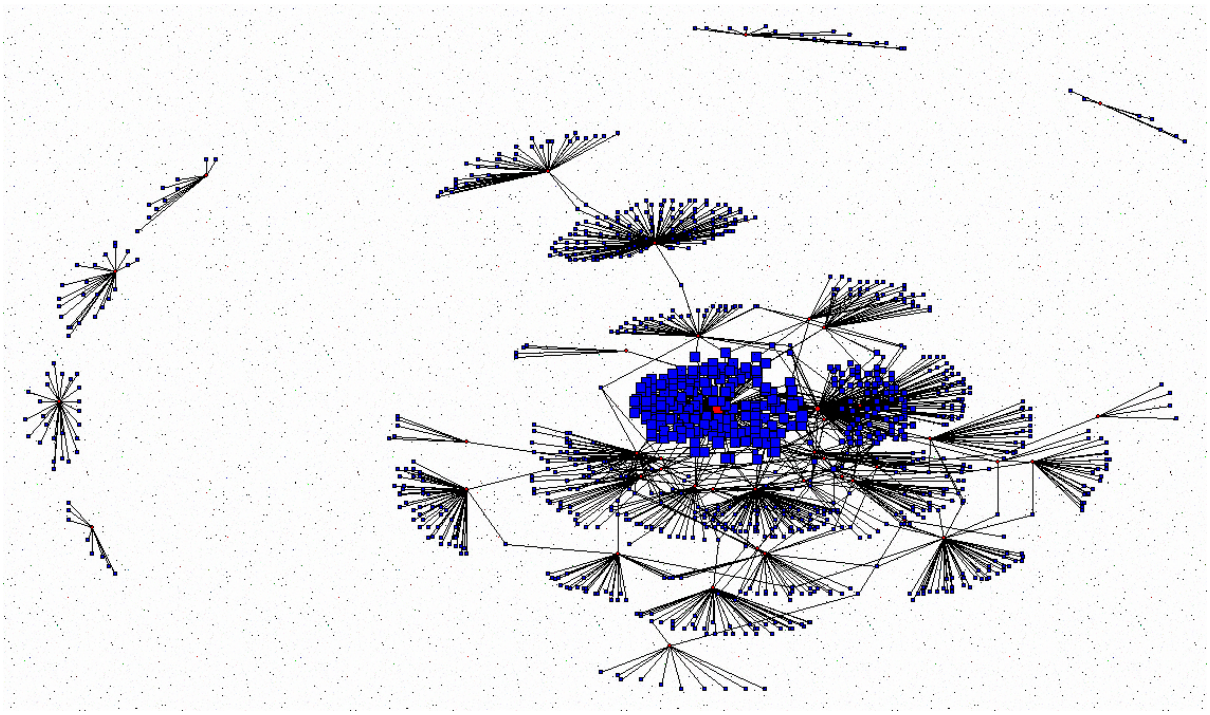

Figure 19. Network Map of the North American electronic dance music festival circuit (labels omitted for clarity and node size set by eigenvector score).

Oceania

In the Oceanian Top 100 we find that artists are concentrated only in two categories, 'high' centrality and 'very low' centrality. Amongst the 66 artists with 'high' eigenvector scores, 43.9% (n=29) are Oceanian, 39.4% (n=26) are European, 13.6% (n=9) are North American, and 3% (n=2) are South American, while amongst the 34 artists with 'low' eigenvector scores, 67.6% (n=23) are Oceanian, 26.5% (n=9) are European, and 5.9% (n=2) are North American.

Taking a look at how the number of Oceanian entries to foreign Top 100 lists changes when centrality is set by eigenvector scores, we find that the number drops from 7 to 4. Thus, with a total of 48 foreign entries in the Oceania Top 100 and 4 Oceanian artists making entries in the Top 100 lists abroad the representativeness ratio decreases from 0.14 to 0.083. This

means that for every Oceanian artist that enters a foreign Top 100 list there are 12 foreign artists that enter the Oceania Top 100.

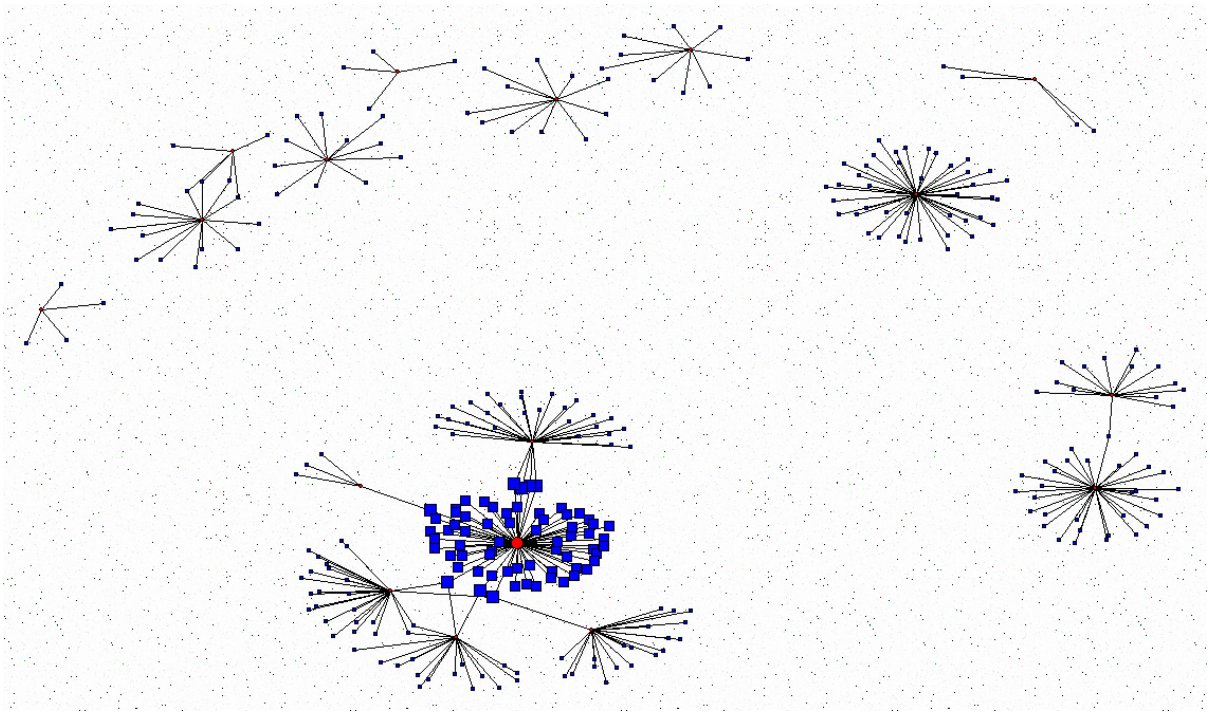

Figure 20. Network Map of the Oceanian electronic dance music festival circuit (labels omitted for clarity and node size set by eigenvector score).

South America

A similar pattern to that of Oceania occurs in the South American Top 100, with all artists belonging to either the 'high' or 'low' centrality categories. From the 93 artists with 'high' eigenvector scores, 78.5% (n=73) are South American, 12.9% (n=12) are European, 3.2% (n=3) are North American, 1.1% (n=1) are African, 1.1% (n=1) are Oceanian, and 3.2% (n=3) have missing nationality. In the 'low' eigenvector category there are 7 artists, with 42.9% (n=3) coming from Asia, 28.6% (n=2) coming from Europe, and 28.6% (n=2) coming from South America.

In regard to South America's 'outgoing' artists, they make 5 entries in foreign Top 100 lists. This takes the ratio for South America from 0.2 to 0.23, meaning that for every South American artist that enters a foreign Top 100 list there are 4.4 foreign entries in the South America Top 100 which does not differ greatly from the situation under degree centrality.

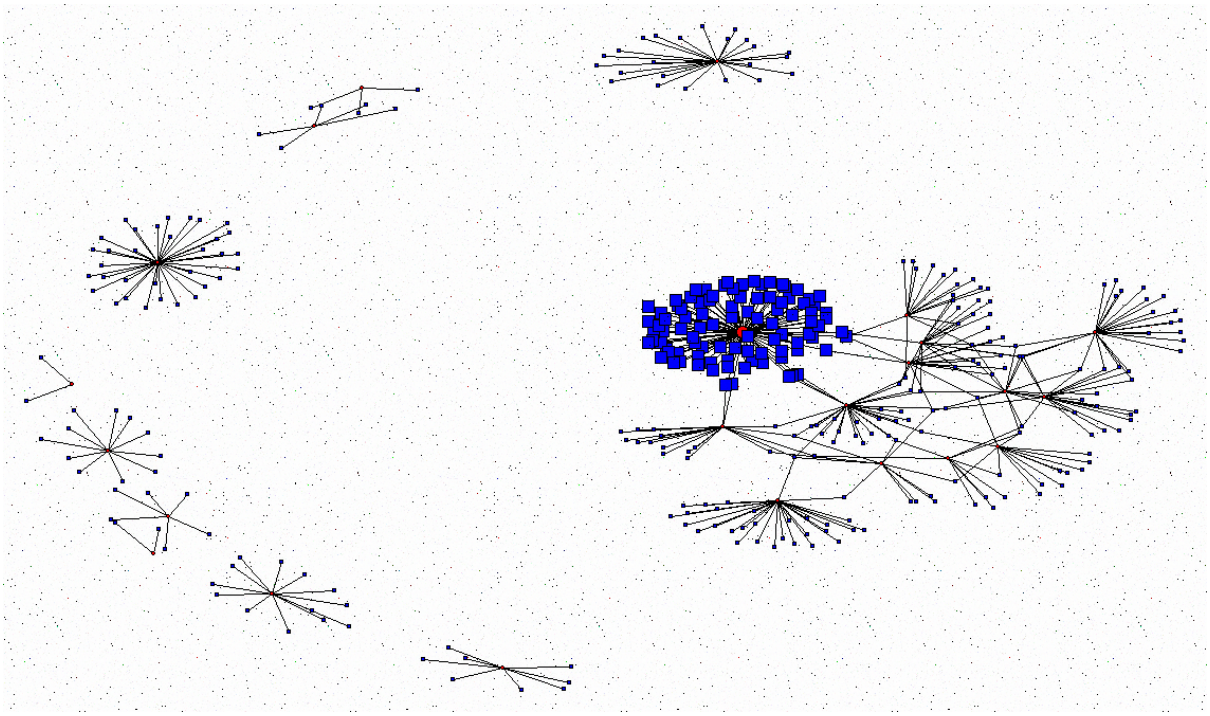

Figure 21. Network Map of the South American electronic dance music festival network (labels omitted for clarity and node size set by eigenvector score).

4.2.2 Superstars

In similar fashion to Section 6.1.2, we take a look at the artists that can be classified as 'superstars' (Table 6) by appearing in more than one continent's Top 100 list by eigenvector centrality, meaning they hold a central position in more than one of the festival circuits analysed. There are 26 artists which entered the Top 100 by eigenvector centrality in more than one continent. The first thing which can be seen is that 9 of the artists in this list were also present in the 'superstar' list by degree centrality. These are Armin van Buuren (NL), Axwell Λ Ingrosso (SE), Dubfire (US), Bliss (IL), Eats Everything (UK), Fedde le Grand (NL), Hardwell (NL), Jamie Jones (UK), and Cesqeaux (NL). Besides these mainstay superstars, there are 17 new names which were not considered superstars by their degree centrality but are considered superstars by their eigenvector scores. Despite this variation in which artists make up the superstar list, one thing that stays constant is the geographic areas from which these superstars hail. 65.4% (n=17) are European, 30.8% (n=8) are North American, and 3.8% (n=1) are Asian.

Table 6. Superstar artists (present in the Top 100 lists of at least two continents)

Artist	Country of Origin	Continent of Origin	Number of Top 100 Appearances
Axwell λ Ingrosso	Sweden	Europe	3
Alan Walker	Norway	Europe	2
Armin van Buuren	Netherlands	Europe	2
Bliss	Israel	Asia	2
Cesqeaux	Netherlands	Europe	2
Cheat Codes	US	North America	2
Dubfire	US	North America	2
Eats Everything	UK	Europe	2
Fedde le Grand	Netherlands	Europe	2
Galantis	Sweden	Europe	2
Hardwell	Netherlands	Europe	2
Jamie Jones	UK	Europe	2
Maceo Plex	US	North America	2
Malaa	France	Europe	2
Marshmello	US	North America	2
Mykris	US	North America	2
NGHTMARE	US	North America	2
Nicky Romero	Netherlands	Europe	2
Oliver Heldens	Netherlands	Europe	2
Pan-pot	Germany	Europe	2
Salvatore Ganacci	Sweden	Europe	2
Seth Troxler	US	North America	2
Slander	US	North America	2
Sven Vath	Germany	Europe	2
Talpa	Serbia	Europe	2
Tchami	France	Europe	2

4.3 On the Presence of Systematic Underrepresentation

The outlined results point towards the conclusion that European and, though to a lesser extent, North American artists are better represented in the world stage than their peers from other continents. This means that the underrepresentation of artists from the 'Global South' at Dekmantel brought to light by artist Valesuchi is not a blip in the festival circuit, but rather a trait of it. European and North American artists are overrepresented while artists from other regions of the world are underrepresented, as proven by the outgoing to incoming artist ratios presented in Sections 4.1 and 4.2. In the case of Europe, the overrepresentation of its artists originates from both the large number of European artists that play in festivals abroad and the low number of foreign artists that European festivals book (see Figures 23,24). This puts European artists in a very favourable position as their local programmers do not seem to look for talent beyond their continent, while at the same time programmers in other continents look to Europe for bookable acts in a disproportionate amount. In fact, for every

artist that European programmers invite from abroad, almost 21 European artists are invited to play in festivals abroad (see Appendix 4).

Certain countries in Europe contribute more to this European ascendancy than others, as can be seen in Figure 25 which shows, for each country, the number of artists that appear in foreign Top 100 lists (foreign meaning continents other than the one where the country is located). Amongst the European countries, the United Kingdom, the Netherlands, and Germany are the top three countries whose artists appear most often in foreign Top 100 lists.

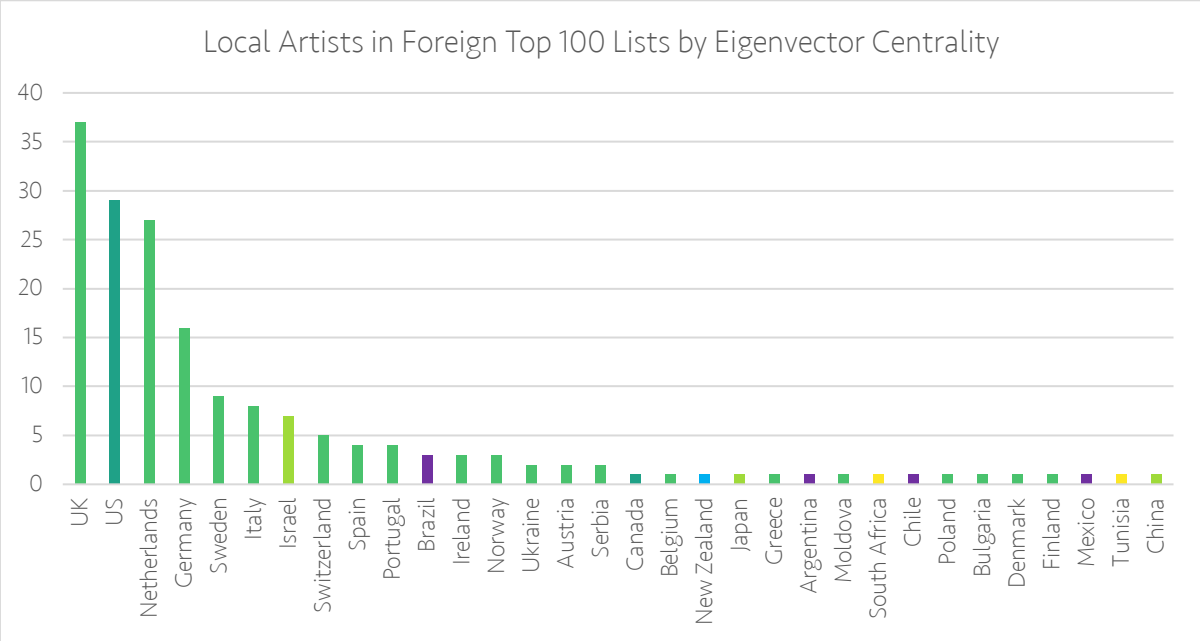

Figure 22. Countries with most entries in foreign Top 100 lists (colour-coded by continent).

The story in North America is slightly different but favourable nonetheless – numerous artists from the continent play in foreign festivals, however, North American festivals also invite a large number of foreign artists to play. On the other hand, the Asian circuit is the best example of how local artists outside Europe and North America are underrepresented. From the 100 artists that played the most shows in Asia 46 were European and 17 were North American. The reasons behind this overrepresentation of artists from Europe and North America are beyond the scope of this paper. However, one thing that remains clear from the results is that, other than a few exceptions, artists from Europe and North America are the only groups that attain success are beyond their home continent.

5. Limitations

This study has created a framework which highlights the importance of participation in festivals for artists and their career development and presents extensive empirical insight into the demographic group of artists which are most represented in the electronic dance music festival circuit. There are, however, a number of limitations which stem for the most part from the necessary sampling that was done in order to overcome the unfeasibility of utilising the initial full electronic dance music festival database. These limitations are identified, along with their potential implications on the results, in the following sections.

5.1 The Role of Electronic Dance Music Subgenre in Centrality Scores

UCINET computes centrality scores by making sense of the edges (i.e. relations) between the nodes that are present in the dataset. In the dataset, these nodes are the festivals and artists, while the edges are created by the software when there is an artist-festival pairing (i.e. an artist has appeared at a festival). These edges also connect festivals to each other through the artists they share in common. An example of these connections can be seen below in the fragment of the network map of the South American electronic dance music festival circuit (Figure 26).

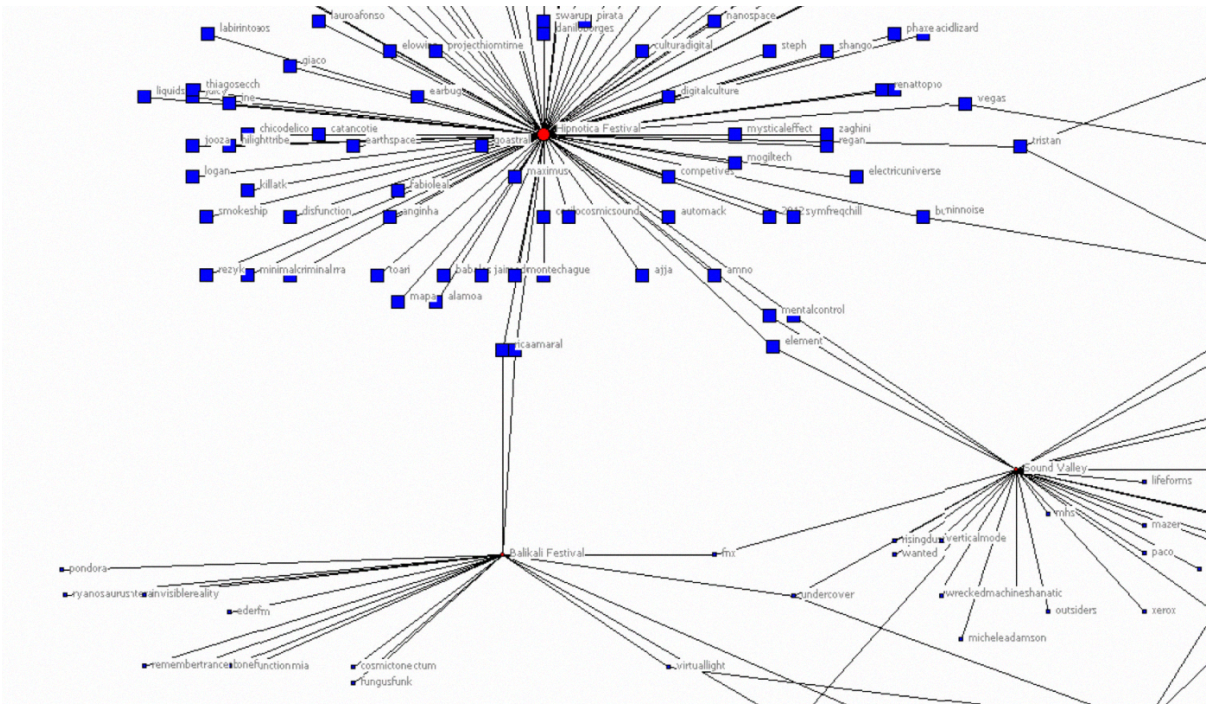

Figure 23. Fraction of the South American festival circuit network map showing the 'core' festivals and their connections.

Here, Hipnotica Festival (BR), the festival in South America with the highest eigenvector score (EIG=0.114), is connected to the festival with the second highest eigenvector

score, Sound Valley Festival (BR) (EIG=0.006), through artists such as Element (BR) and Mental Control (BR) and with Balikali Festival (BR) (EIG=0.004) through artists such as Rica Amaral (BR). These are the three festivals in South America with the highest eigenvector scores. The reason for this, however, is that the simple random sample of South American festivals was abundant with Brazilian festivals, specifically those that focus on Psytrance, a subgenre of electronic dance music. Since these three festivals focus on Psytrance and all three are large festivals that exclusively book Psytrance artists, they have numerous nodes (i.e. artists) in common thus leading UCINET to categorise them as the core of the South American festival circuit. This is a downfall of creating a smaller subsample from a dataset that includes festivals that represent the entirety of the electronic dance music subgenre spectrum. Festivals in South America that may be important but book mainly, for example, techno artists, such as EAST Festival (UY), may be left with no connections to other festivals if no other festival which books techno artists is present in the subsample, which was the case here (see Figure 27).

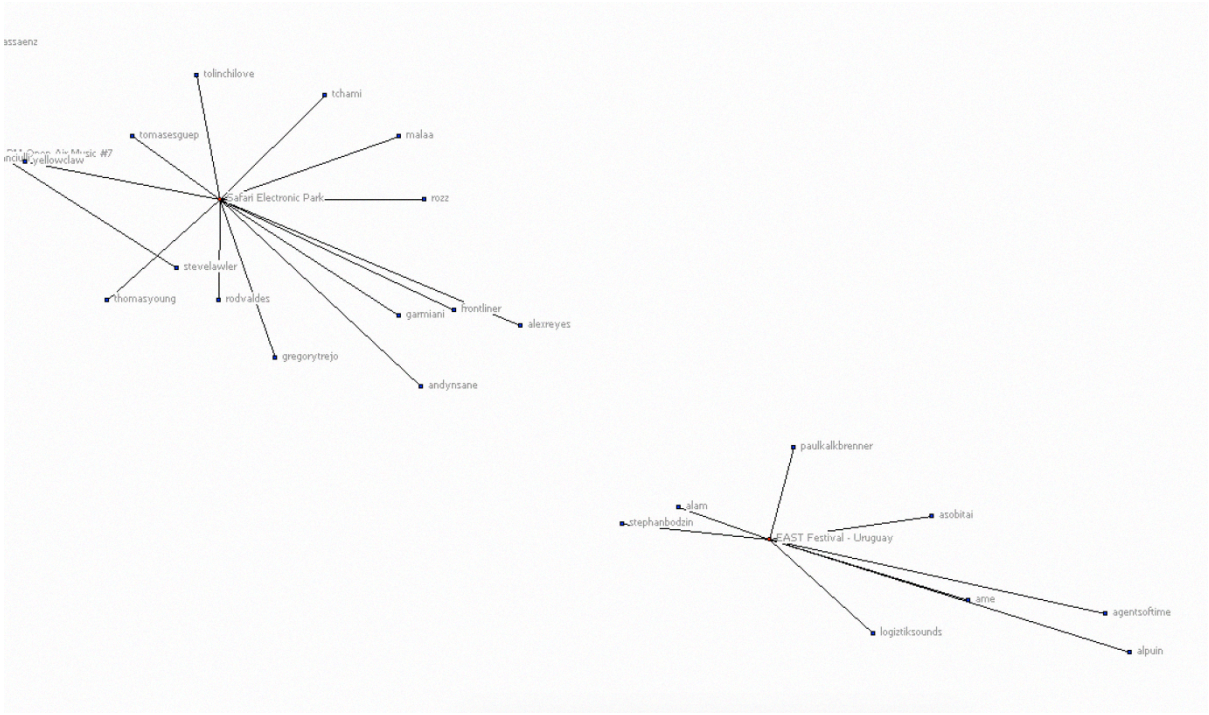

Figure 24. Fraction of the South American festival circuit network map showing two 'peripherical' festivals with no artists in common and disconnected from the core.

The fact that the eigenvector scores are dictated by the observations within the subsample means that every time the dataset is sampled as done in this paper (or with any other sampling method) the resulting eigenvector scores will differ. In order to approach the 'true' eigenvector centrality scores of artists and festivals, several samples would have to be

obtained from the original dataset and the analysis carried out in this paper would have to be applied to each one. This would be an interesting extension to the present study.

6. Conclusion and Concluding Comments

With electronic dance music festivals becoming the main stage for electronic dance music and expanding to all corners of the world, this paper sought to study one of the more controversial aspects of these festivals: their programming and how it is, purposefully or not, biased towards artists from 'developed' regions. Specifically, this study sought to establish whether artists from certain regions enter the festival circuit more than others, as well as to build a framework around the mechanisms of electronic dance music festivals that in the presence of underrepresentation would hinder the advancement towards a truly global festival circuit due to their field-configuring properties.

The data confirms the predominance of European and, to a lesser extent, North American electronic music artists and DJs – meaning that the research question posed Section 1 can be answered with a definitive yes. Artists from the European and North American geographic regions routinely figure more prominently (by centrality and number of shows) not only in their home festival circuit but also in the festival circuits of other continents. On the other hand, artists and DJs from Africa, Asia, Oceania, and South America are only booked in their local circuit (with a few individual exceptions). The inequality becomes more pronounced when the group of artists who find success in more than one continent's festival circuit is analysed. According to degree centrality, 83.4% of artists in this highest echelon of the global electronic dance music circuit come from either Europe or North America, while this share increases to 96.2% when centrality is gauged by eigenvector scores. Programmers and the wider electronic dance music community should be aware of this bias towards Western artists. For a scene which champions the values of progressivism, unity, and non-central governance, the demographic of artists that are booked and programmed in festivals share a lot in common with traditional art fields such as the visual art and its surrounding market.

These results lead towards the conclusion that there are a variety of factors at play which nudge festival programmers and bookers to include European and North American artists in the festival lineup, sometimes at the expense of local artistic talent. Tentatively, these factors could be (1) economic: festivals see larger returns or ticket sales when including

Western artists in their lineup, (2) related to quality: festivals believe that artists from these regions are of higher quality than their non-Western peers, (3) related to audience preferences: the public prefers to attend festivals in which artists from Europe or North America perform, or tied to a variety of other reasons. As previously mentioned, the reasons behind this inequality amongst artists of different nationalities lie beyond the scope of this paper, and in fact are probably best studied through a sociological lens. This study hopes to turn a mirror on a scene which in its process of professionalisation and institutionalisation has fallen back on the all-too-present Eurocentrism which has dominated other art industries, and perhaps catalyse a re-evaluation of programming practices which is more in line with the core values of electronic dance music.

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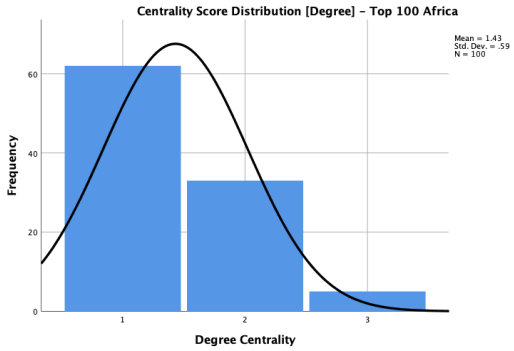
Appendix

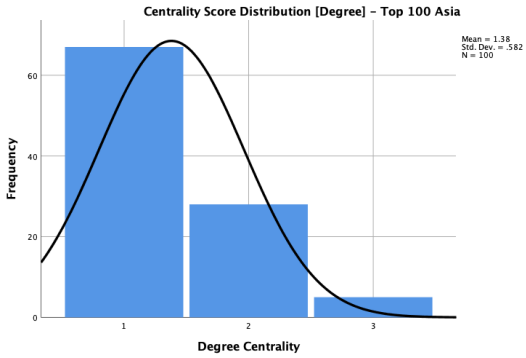
Appendix 1 – Dataset in Matrix Form

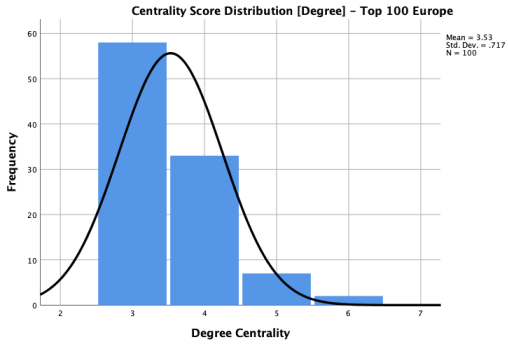
Festival	Artists							
	Amotik	Amy.g.dala	an-i	Ana Malo	Anastasia Kristensen	Anbu	Anchor Song	AnD
ZeeZout Festival Winter Festival	0	0	0	0	1	0	0	0
WORLD LEAGUE - Day & Night	0	0	0	0	0	0	0	0
Wooded	0	0	0	0	0	0	0	0
Warehouse Project - Rush Hour	0	0	0	0	0	0	0	0
Verknipt Techno Special	1	0	0	0	1	0	0	1
Verknipt ADE Special	0	0	0	0	0	0	0	1

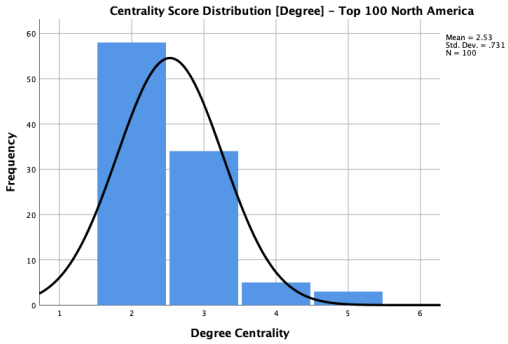
1 denotes that an artist has played at a certain festival. 0 denotes that the artist did not make an appearance at the festival.

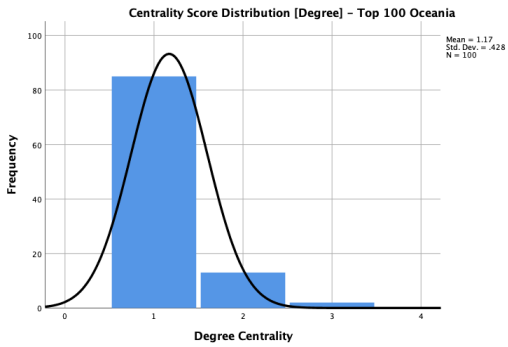
Appendix 2 – Degree Centrality Distribution

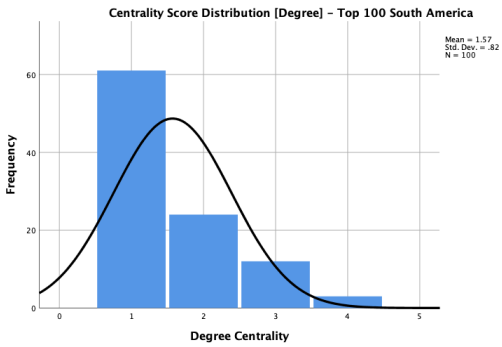












Appendix 3 – Festivals in Subsample

Festival	DEG	EIG	Country	Continent
Rezonance Festival	54	0.158	South Africa	Africa
Freaky New Year	49	0.032	South Africa	Africa
Moksha	41	0.008	South Africa	Africa
Billy's Beach	37	0.008	South Africa	Africa
Electric Circus	31	0.002	South Africa	Africa
Sunflower Music Festival	31	0.016	South Africa	Africa
Fairground Festival	22	0.005	Tunisia	Africa
Organik - Gaian Dream	21	0.038	South Africa	Africa
Fenomena Phestival	17	0.002	South Africa	Africa
Valley of Light	17	0.011	South Africa	Africa
AFROPUNK - Johannesburg	14	0.000	South Africa	Africa
Resistance - Taipei	56	0.142	Taiwan	Asia
Sunburn Pune	49	0.057	India	Asia
Dropzone	44	0.013	Thailand	Asia
World Club Dome - Korea	41	0.025	Korea	Asia
Beamfest	32	0.000	Thailand	Asia
Dwarka Festival	30	0.000	India	Asia
Miracle Festival	30	0.005	Taiwan	Asia
UNITY Festival	25	0.000	Israel	Asia
Daydream Festival - China	19	0.002	China	Asia
Rural	18	0.000	Japan	Asia
Satellite Beachside	16	0.000	India	Asia
NEON Music Festival - Beijing	12	0.003	Malaysia	Asia
BAT Electronic Music Festival	11	0.003	China	Asia
Clockenflap	11	0.003	Hong Kong	Asia
North Fest	11	0.002	Thailand	Asia
Full Moon Party in Yangon	10	0.000	Myanmar	Asia
Transmission - Shanghai	9	0.000	China	Asia
The Gardens of Babylon - Istanbul	8	0.000	Turkey	Asia
Genesis	7	0.001	Thailand	Asia
Sunny side up	7	0.000	Indonesia	Asia
Elrow - Istanbul	6	0.000	Turkey	Asia
Invasion Festival	6	0.001	Myanmar	Asia
Sunburn Daman	5	0.004	India	Asia
The Gardens of Babylon - Dubai	5	0.000	United Arab Emirates	Asia
Sunburn City Festival Bengaluru	4	0.003	India	Asia
Mysteryland	238	0.105	Netherlands	Europe
Dekmantel	129	0.001	Netherlands	Europe

Nuits Sonores	123	0.001	France	Europe
SW4 Festival	112	0.009	United Kingdom	Europe
S2S In the Park	105	0.000	United Kingdom	Europe
Freshtival	100	0.018	Netherlands	Europe
Lovefest	98	0.005	Serbia	Europe
7th Sunday Festival	96	0.015	Netherlands	Europe
Parels van de Stad	96	0.014	Netherlands	Europe
Airforce Festival	91	0.011	Netherlands	Europe
Soundwave Festival	86	0.000	Croatia	Europe
Defected - Croatia	81	0.000	Croatia	Europe
No Sleep Festival	75	0.001	Serbia	Europe
Sunandbass	75	0.000	Italy	Europe
Dreambeach	74	0.011	Spain	Europe
Weekend Festival	73	0.007	Finland	Europe
Krake Festival	65	0.000	Germany	Europe
Dream Village	63	0.014	Netherlands	Europe
Westfest	63	0.001	United Kingdom	Europe
Loveland Festival	54	0.001	Netherlands	Europe
Beatcoin Festival	52	0.005	Netherlands	Europe
Verknipt ADE Special	52	0.001	Netherlands	Europe
Micro Love Festival	48	0.000	France	Europe
Jungle Beat Festival	47	0.000	Germany	Europe
Ostrov Festival	47	0.000	Ukraine	Europe
Strom Festival	46	0.000	Denmark	Europe
Emmabodafestivalen	45	0.001	Sweden	Europe
Hoppla! Festival	42	0.000	Germany	Europe
Awakenings x ADE	41	0.001	Netherlands	Europe
Sloopcongres	40	0.003	Netherlands	Europe
Waterland	40	0.000	Finland	Europe
Seeds of Freedom Festival	39	0.000	Portugal	Europe
Verknipt Techno Special	37	0.001	Netherlands	Europe
In Trance we trust - ADE Festival	35	0.000	Netherlands	Europe
Spring Attitude Festival	35	0.000	Italy	Europe
Warehouse Project - Metropolis	34	0.000	United Kingdom	Europe
BeeFree Festival	32	0.000	Slovakia	Europe
Liebe Bass Freiheit	32	0.000	Germany	Europe
Revolution Festival	32	0.000	Romania	Europe
Shapes - Sandefjord	32	0.000	Norway	Europe
Valhalla Festival	31	0.006	Netherlands	Europe
Dreamz Festival	30	0.000	Belgium	Europe
The Walking Bass Festival	30	0.000	France	Europe
Odyssia	28	0.000	Greece	Europe

Sunbeatz Ibiza	28	0.000	Spain	Europe
Winter Visions	27	0.000	Germany	Europe
Mystic World Festival	25	0.001	Netherlands	Europe
MemoryLand	24	0.000	Hungary	Europe
roBOt Festival	24	0.000	Italy	Europe
SNOW Open Air	23	0.000	Germany	Europe
REACTiVATE	21	0.002	Netherlands	Europe
Triangle Indoor	21	0.000	Netherlands	Europe
ZeeZout Festival Winter Festival	21	0.000	Netherlands	Europe
HYPERBEAT Festival	20	0.000	Austria	Europe
Moonlovers	20	0.000	Spain	Europe
Warehouse Project - Rush Hour	20	0.000	United Kingdom	Europe
Wooded	20	0.000	Poland	Europe
24 H Summer Special - September	19	0.000	Germany	Europe
Citania Summer Fest	19	0.000	Portugal	Europe
SORANJE KINGSDAY FESTIVAL	19	0.001	Netherlands	Europe
Sticker Mule Festival	19	0.000	Italy	Europe
Wave Festival - Sweden	19	0.000	Sweden	Europe
Immersion	18	0.000	France	Europe
Columba Techno Festival	17	0.000	Spain	Europe
Endstation Open Air	17	0.000	Germany	Europe
Sensation White - Poland	17	0.002	Poland	Europe
Warehouse Project - Jackmaster	17	0.000	United Kingdom	Europe
DGTL Festival - Madrid	16	0.000	Spain	Europe
Groove Loch Ness	16	0.001	United Kingdom	Europe
Dagvlinder Indoor Festival	15	0.000	Netherlands	Europe
Revolution Festival - Poland	15	0.000	Poland	Europe
Warehouse Project - Knee Deep	15	0.000	United Kingdom	Europe
Wild Kingdom - Winterfestival	15	0.001	Netherlands	Europe
LWE - Labyrinth	14	0.001	United Kingdom	Europe
Meet Me Backstage - NYE	14	0.001	Netherlands	Europe
L'Equinoxe Festival	13	0.000	France	Europe
Southmoon Festival	13	0.000	Spain	Europe
Central 43	12	0.000	France	Europe
Puur Oud & Nieuw - Winterfestival	11	0.000	Netherlands	Europe
QLIMAX	11	0.004	Netherlands	Europe
The Hydra present Mount Kimbie Curate	11	0.000	United Kingdom	Europe
The Vibe Guide Festival	10	0.001	Croatia	Europe
BE TOGETHER - Open Air	9	0.000	Switzerland	Europe
Brunch Electronic - Lisboa - Halloween special	9	0.000	Portugal	Europe
Brunch in the Park - Barcelona - 11	9	0.000	Spain	Europe
Day One Lisbon	9	0.000	Portugal	Europe

Electronic Family - Poland	9	0.000	Poland	Europe
Holi Festival of Colours - Bochum	9	0.000	Germany	Europe
Les Siestes Electroniques - Portugal	9	0.000	Portugal	Europe
Stil vor Talent Festival - Berlin	9	0.001	Germany	Europe
Hard Flash	8	0.000	Czech Republic	Europe
Origen Fest	8	0.000	Spain	Europe
Citymatine - Golftanya	7	0.000	Hungary	Europe
Definition Hardcore	7	0.001	Netherlands	Europe
Gaggalacka Festival	7	0.000	Germany	Europe
New Year's Eve - Affligem	7	0.000	Belgium	Europe
Ruhestorung festival - Innsbruck	7	0.000	Austria	Europe
Seelectronic	7	0.000	Germany	Europe
STRAF WERK – Rotterdam	7	0.000	Netherlands	Europe
Dome	6	0.000	Moldova	Europe
Toffler - Spectrum	6	0.000	Netherlands	Europe
Winter Grind	6	0.001	Estonia	Europe
WORLD LEAGUE - Day & Night	6	0.000	Germany	Europe
Awakenings - Early NYE Special	5	0.000	Netherlands	Europe
Music Summit Festival	5	0.000	Switzerland	Europe
My Life Festival	3	0.000	France	Europe
Ultra Miami	214	0.094	United States	North America
Poison Festival	124	0.000	Mexico	North America
Spring Awakening Festival	120	0.022	United States	North America
Movement Detroit	94	0.008	United States	North America
Ultra Music Festival - Mexico	61	0.010	Mexico	North America
Friendship	51	0.003	United States	North America
Apparitions Festival	49	0.000	Mexico	North America
Toxic Summer	46	0.000	United States	North America
The Groove Cruise - California	40	0.001	United States	North America
Comunite 2018	39	0.000	Mexico	North America
Pangea	36	0.000	United States	North America
The Social Festival - Mexico	31	0.004	Mexico	North America
Elements - NYC	30	0.000	United States	North America
Minus Zero Festival - Vermont	30	0.001	United States	North America
Dreamstate - San Francisco	29	0.001	United States	North America
CLUSTXR	27	0.000	United States	North America
Fractalfest	25	0.000	United States	North America
BangOn! - NYC Halloween	24	0.000	United States	North America
Nightfall	23	0.001	United States	North America
Wasteland	23	0.000	United States	North America
Freaknight	22	0.002	United States	North America
Secret Project	22	0.001	United States	North America

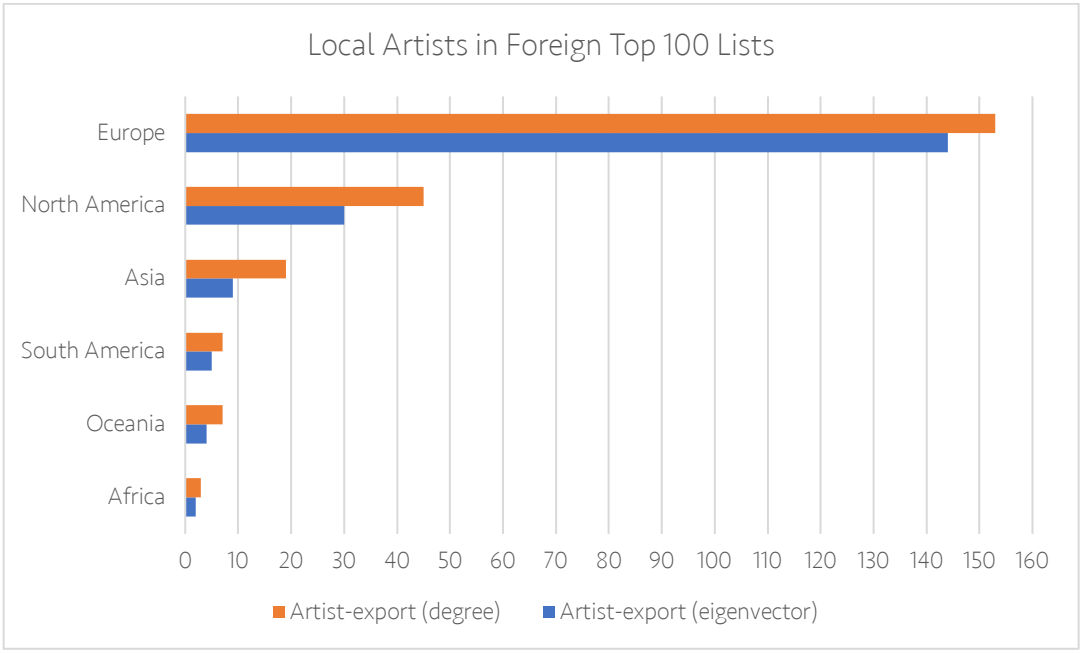
electro-techno-disco LOVE	18	0.001	United States	North America
The Hard Day Of The Dead	18	0.000	United States	North America
Moonshine Gathering	16	0.000	Mexico	North America
POPNYE	16	0.002	United States	North America
Resolution	14	0.001	United States	North America
Audiotistic - Southern California	13	0.002	United States	North America
Boo! - San Francisco	12	0.003	United States	North America
Piknic electronik - Austin #1	12	0.000	United States	North America
Xibalba Festival	12	0.000	Mexico	North America
Electric Island	10	0.000	United States	North America
HYTE Miami	10	0.002	United States	North America
PIKNIC eLECTRONIK - Montreal #8	8	0.000	Canada	North America
HTID - San Francisco	7	0.000	United States	North America
Scream	7	0.001	Canada	North America
Bassrush Massive - Arizona	6	0.001	United States	North America
Dirtybird BBQ - Oakland	6	0.001	United States	North America
Get Lost - Mexico City	6	0.000	Mexico	North America
Sensation White - Monterrey	6	0.001	Mexico	North America
Foam Wonderland - San Antonio	5	0.000	United States	North America
Parade of Lasers - Fresno	4	0.000	United States	North America
All Day I Dream - Los Angeles	3	0.000	United States	North America
Pitch Music and Arts Festival	66	0.139	Australia	Oceania
Hard Island Australia	41	0.000	Australia	Oceania
Eatons Hill Hotel NYD	31	0.000	Australia	Oceania
The Petting Zoo	31	0.016	Australia	Oceania
Hopkins Creek	25	0.007	Australia	Oceania
Sugar Mountain	20	0.003	Australia	Oceania
Freedom Time - Winter	19	0.006	Australia	Oceania
Circoloco - Perth	14	0.000	Australia	Oceania
Our House Festival	14	0.000	New Zealand	Oceania
Knockout	11	0.000	Australia	Oceania
The Left Bank - Xmas Eve	11	0.000	Australia	Oceania
Highlife New Year	9	0.000	New Zealand	Oceania
Circoloco - Melbourne	6	0.000	Australia	Oceania
Electric Gardens - Brisbane	4	0.000	Australia	Oceania
Paradigm - Adelaide	4	0.000	Australia	Oceania
Pure - Brisbane	4	0.000	Australia	Oceania
The Warehouse Collective - Knee Deep In Sydney	4	0.002	Australia	Oceania
Hipnotica Festival	94	0,114	Brazil	South America
Creamfields - Santiago	33	0	Chile	South America
Gamaya Festival	30	0	Brazil	South America
Sound Valley	29	0,006	Brazil	South America

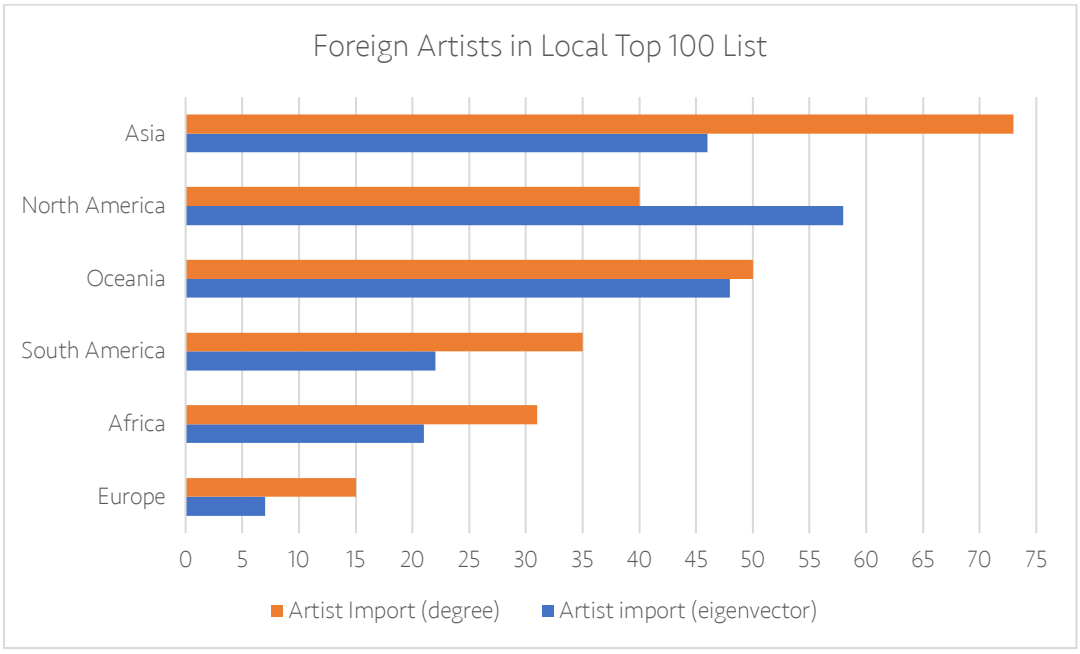
Partai Festival	23	0	Venezuela	South America
So Track Boa Festival	23	0	Brazil	South America
Balikali Festival	19	0,003	Brazil	South America
XXXPERIENCE - Brasilia	16	0	Brazil	South America
XXXPERIENCE ONE STAGE - Porto Alegre	16	0,002	Brazil	South America
LOW Session	15	0	Brazil	South America
Liquid Sky - Praia da Pipa	14	0,003	Brazil	South America
Titans Open Air	14	0,002	Brazil	South America
Fresh Water Festival	13	0	Brazil	South America
Safari Electronic Park	13	0	Peru	South America
Breakfest	11	0	Colombia	South America
Dream On	11	0	Brazil	South America
GrooveOhm	9	0	Brazil	South America
EAST Festival - Uruguay	8	0	Uruguay	South America
Ritvales	6	0	Brazil	South America
Corona Sunset - Baru	5	0	Colombia	South America
Life in Color - Cochabamba	3	0	Bolivia	South America
PM Open Air Music #7	2	0	Argentina	South America
The Social Festival - Argentina	2	0	Argentina	South America

Appendix 4 – Outgoing-to-incoming artist ratio per continent

Continent	Artist export/import ratio (eigenvector)	Artist export/import ratio (degree)
Europe	20.57	10.2
North America	0.52	1.13
Asia	0.20	0.26
South America	0.23	0.2
Oceania	0.08	0.14
Africa	0.10	0.097

Appendix 5 – Local artists which enter Top 100 lists abroad and Foreign artists which enter the local Top 100 list (for each continent)





Appendix 6 – Eigenvector Centrality Distribution