Translocality, Network Structure, and Music Worlds: Underground Metal in the United Kingdom

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Abstract

Translocal music worlds are often defined as networks of local music worlds. However, their networked character and more especially their network structure is generally assumed rather than concretely mapped and explored. Formal social network analysis (SNA) is beginning to attract interest in music sociology but it has not previously been used to explore a translocal music world. In this paper, drawing upon a survey of the participation of 474 enthusiasts in 148 live music events, spread across 6 localities, we use SNA to explore a significant "slice" of the network structure of the U.K.'s translocal underground heavy metal world. Translocality is generated in a number of ways, we suggest, but one way, the way we focus upon, involves audiences traveling between localities to attend gigs and festivals. Our analysis of this network uncovers a core-periphery structure which, we further find, maps onto locality. Not all live events enjoy equal standing in our music world and some localities are better placed to capture more prestigious events, encouraging inward travel. The identification of such structures, and the inequality they point to, is, we believe, one of several benefits of using SNA to analyze translocal music worlds.

Résumé

Les mondes musicaux translocaux sont souvent définis comme des réseaux de mondes musicaux locaux. Cependant, leur caractère

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'réseauté' et, plus particulièrement, leur structure de réseau sont plus souvent présumés plutôt que cartographiés et explorés de manière concrète. L'analyse formelle des réseaux sociaux commence à générer de l'intérêt en sociologie de la musique mais n'a pas auparavant été utilisée pour explorer un monde musical translocal. Dans cet article, qui se base sur une enquête de la participation de 474 personnes enthousiastes à 148 évènements de musique live s'étant déroulés dans 6 localités, nous utilisons une analyse des réseaux pour explorer une 'tranche' significative de la structure du réseau du monde translocal underground de heavy métal au Royaume-Uni. Nous suggérons que la translocalité est créée d'un certain nombre de manières. L'une d'entre elles, sur laquelle nous nous concentrons ici, implique que les audiences voyagent entre les localités pour assister aux concerts et festivals. Notre analyse de ce réseau révèle une structure centre-périphérie qui cartographie les localités. Les concerts live ne jouissent pas tous d'une même réputation dans le monde musical et certaines localités sont mieux placées pour capter des évènements plus prestigieux, encourageant ainsi des déplacements dans leur direction. L'identification de telles structures et l'inégalité qu'elles indiquent est, nous le croyons, l'un de nombreux avantages d'utiliser l'analyse des réseaux sociaux pour étudier les mondes musicaux translocaux.

IN THIS PAPER, we use formal social network analysis (SNA) to explore the network structure of the U.K.'s translocal underground heavy metal music world (UMW). This is intended as a contribution both to current debates on "music worlds" and also to the emerging literature on musical networks and the potential of SNA for their analysis (Allington, Dueck, and Jordanous 2015; Becker 1982, 2004, 2006; Crossley 2015a, 2015b; Crossley and Bottero 2015b; Crossley and Emms 2016; Crossley, McAndrews, and Widdop 2015; Finnegan 1989; Gilmore 1987, 1988; Lopes 2002; Martin 2005, 2006; McAndrew and Everett 2015; Millward, Widdop, and Halpin 2017). The paper forms part of a larger project being conducted by the first-named author, which employs a mixed-method approach to investigate various aspects of the UMW, combining a questionnaire survey of participation patterns among 474 insiders with ethnographic observation and 29 qualitative interviews with occupants of a variety of roles within this music world (Emms 2017). Here, we focus primarily upon the survey data. However, we drew upon the qualitative material in designing the survey and we use it in this paper both for illustrative purposes and in interpreting survey findings. We begin with a discussion of the concepts which frame our analysis. "Music Worlds" is based upon Howard Becker's (1974, 1982) concept of "art worlds" (Crossley 2015b). Art is collective action for Becker and an "art world" is, among other things, the collective involved in the making of a particular type of art; where "making" includes perceiving, interpreting, and appreciating, such that audiences belong to this collective, alongside artists and various support personnel. "Music worlds" applies this idea to collectives involved in

making music specifically or "musicking," to use Small's (1998) felicitous term.

The world concept directs our attention to: (1) interactions involved in musicking; (2) situational definitions of music and/or its distinctive styles; (3) time spaces (events) where musicking is done; (4) networks of participants, including musicians, audiences, and support personnel (e.g., managers, promoters, and producers); (5) conventions that facilitate coordination of the contributions of these participants and give specific instances of musicking their distinctive style; (6) the resources necessary for musicking, which are mobilized and exchanged within a world's network and distributed unevenly across it, creating inequalities and imbalances of power; and (7) processes of identity formation implicated in these various aspects. In this paper, we will be focusing upon *networks* and *events* in particular, or rather networks *of* events.

"World" is one of several concepts that has been coined to capture music making collectives. The main alternatives are "field," which is rooted in the work of Bourdieu (1993), and "scene," a term in lay as well as academic use, which has a long history in music sociology (e.g., Keil 1966; Newton 1961; Straw 1991) and has been theorized in conflicting ways (Hesmondhalgh 2005). These concepts overlap in many respects and there is much of value in their respective literatures. We have learned from them all. We find Becker more persuasive than Bourdieu, however, and believe that his framework is both more coherent and less constraining with respect to the assumptions it makes about the social world and the pathways for research it affords (see also Becker 2006; Bottero and Crossley 2011; Crossley 2011). In addition, we agree with Hesmondhalgh (2005) that different, competing definitions and understandings of "scene," alongside its diverging lay uses, render that concept unclear and liable to misunderstanding. Hence, we frame our analysis in terms of "worlds."

The musical mainstream can be conceptualized as a world (Crossley and Emms 2016). However, most work is focused upon more specialized and/or less prominent worlds. Such worlds are interesting because, while not entirely divorced from the mainstream and its commercial imperatives, they operate in its hinterlands, often opposing its (dominant) aesthetic and sometimes the status quo more widely (Negus 1999; Toynbee 2000). Moreover, their modus operandi and scale of operations demonstrate "bottom up" collective action in a domain sometimes perceived exclusively in "top down" terms, most famously by Adorno (1976). Likewise, the importance afforded to noneconomic "internal goods" and "subcultural capital" within worlds serves to dramatize important peculiarities in the political economy of culture (Banks 2012; Crossley and Bottero 2015a; Thornton 1995). Money and other material resources are important in worlds, as in all areas of social life, but they sit alongside other sources of value with which they sometimes conflict.

A music world might center upon a musical style or substyle (e.g., jazz or hard-bop), locality (e.g., the Toronto music world), organizational ethos (e.g., do-it-yourself [DIY]), political ideology (e.g., feminism), or some combination of these. In this paper, we look at the world formed around underground heavy metal. Metal has been a prominent and resilient strand of popular music in the United Kingdom since it began to take shape and acquire an identity in the early 1970s (O'Neill 2017). There have been several waves of mainstream success, involving such household names as *Iron Maiden* and *Motorhead*. However, these mainstream developments have been subtended by the formation and flourishing of an underground world which simultaneously both feeds and opposes itself to them.

Underground metal is largely DIY in orientation. Participants work collectively, if also sometimes competitively, to produce, promote, and sustain their music, with no backing from major record labels or other corporations. Stylistically, the music is diverse, with variants including folk-metal, sludge, and goregrind. Christian metal sits alongside the more Satanically inclined death metal. Each of these substyles is characterized by a self-conscious departure from the aesthetic conventions of mainstream metal; however, sometimes to the point that, as sympathetic commentator, Kahn-Harris (2007), observes, it "teeters on the edge of formless noise" (p. 5).

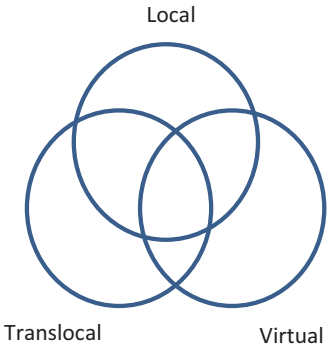
LOCAL, TRANSLOCAL, AND VIRTUAL

As Peterson and Bennett (2004) argue for scenes, worlds can assume *local*, *translocal*, and *virtual* forms. This tripartite schema has been interpreted in different ways and there is some confusion regarding it in the literature, not least among critics who have assumed that its three categories are mutually exclusive (Ma 2002; Solomon 2009). In a bid to clarify this situation, *we propose that they be conceptualized in terms of intersecting sets, as might be represented on a Venn diagram* (see Figure 1). Most contemporary worlds have a virtual aspect. Their participants interact by way of email, Web sites, Twitter, and so on. In some cases, this intersects with offline, local, and/or translocal activity; in others, a world exists exclusively online. The virtual dimension is relatively new, however, and historical studies will often explore worlds with no online component. The early London punk world studied by Crossley (2015b) had no virtual aspect, for example.

Similarly, several local worlds may be linked, forming and nesting within a translocal world, but not in every case. Some may be local only. In the early days of U.K. punk, for example, all activity was localized within a few sites in inner London (Crossley 2015b). Punk was local but not translocal. It is difficult to imagine translocal worlds that involve no local worlds but festival-based worlds, such as Ladyfest (O'Shea 2015), whose presence in any single locality is temporary and depends upon bands and audiences traveling in from dispersed locations, afford an example of how this might happen.

Figure 1

Local, Translocal, and Virtual [Color figure can be viewed at wileyonlinelibrary.com]



We touch upon all three aspects in this paper, but our main focus is the translocal. This aspect has been largely neglected in the literature in favor of a focus upon the local in particular. One of the aims of our study is to begin to redress this imbalance. Many worlds have a translocal aspect and we believe this to be important and in need of further elucidation, both empirical and conceptual.

There is a small translocal literature in which a number of analytic themes have begun to emerge, namely: practices of appropriating "other" music (Madrid 2006; Martin-Iverson 2014); authenticating and legitimating the hybrid results of such appropriations (Bin Quader and Redden 2015; Elafros 2013); the musical construction of place (Harris 2000); and the role of a variety of mechanisms in generating translocal connection, including touring and (recording) distribution circuits (Futrell, Simi, and Gottschalk 2006; Kruse 1993, 2003; Ma 2002); festivals and carnivals (Dowd, Liddle, and Nelson 2004; Hodkinson 2004); the Internet (Cormany 2015; Soloman 2009); diaspora (Soloman 2009); business and education-related travel (Soloman 2009); and the "research trips" of enthusiasts and collectors (Soloman 2009). Our interest, however, is in the definition of translocality, common across many accounts, as a *network* of local sites (see especially, Kruse 1993, 2003; Peterson and Bennett 2004). The second named author has argued elsewhere that local music worlds are best conceived as networks (Crossley 2015b; Crossley et al. 2015; Hield and Crossley 2015). In this paper, building upon this and rejoining the accounts referred to above, we want to suggest that translocal worlds are, in most cases, networks of these networks. Putting that another way,

translocal music worlds are geographically dispersed networks within which we usually find geographically concentrated clusters (i.e., local music worlds). As noted above, there may be exceptional cases of translocal worlds, which do not involve local worlds but these are exceptions, in our view, and in most cases translocal worlds will comprise a concatenation of local worlds.

The network concept suggests a number of potential research foci. Several accounts, for example, refer to processes of diffusion. Connection is said to facilitate the generation of a shared culture and collective identity between different local worlds as tastes, innovations, and ideas flow between them (Kruse 1993, 2003; Peterson and Bennett 2004; Straw 1991). Kruse (2003) suggests a further focus, moreover, when she observes that "locality" is constituted within a translocal network; each locality deriving its identity from its interactions with and perceived differences from the others.

These are important ideas, but they beg a further question regarding the underlying structure of the networks they refer to. The term "network" is used quite loosely and vaguely in the various studies of translocality we have identified. Nobody has attempted to pin a translocal network down, concretely and empirically, mapping and exploring its structure. That is what we aim to do.

Network structure is important because it is the cumulative effect of the various interactions, which constitute a world and therefore allows us to perceive and understand how that world is organized. Moreover, it is an outcome of interaction that generates opportunities and constraints for future interaction, shaping what can happen within a world and how it develops. It is a structure-in-process; shaped by and shaping the interactions that constitute it.

Furthermore, a structural focus allows us to identify and explore inequalities in worlds that may not be visible or may be more difficult to demonstrate by other means. Much existing work on translocal worlds (or scenes) appears to assume that all localities are equal within them. At least no evidence or suggestion to the contrary is offered. In what follows, we will point to important inequalities that come to light when we explore structure.

Network structure can be analyzed by way of formal social network analysis (SNA), a set of mathematically based techniques for recording, mapping, and measuring relational data (Scott 2000; Wasserman and Faust 1994). SNA affords a useful antidote to the rather vague and imprecise way in which "network" is used in much sociology. It demands that we specify precisely the nodes and ties constitutive of a network, rewarding this discipline by allowing us to identify and measure sociologically interesting configurations and properties invisible to the naked eye (and often to "nodes" themselves). Moreover, it allows us to think clearly and concretely about the social interactions and relations constitutive of a music

world. The participants involved in music worlds, along with the events in which they participate, the venues they frequent, and so on are all too easily swallowed up within aggregations or reifying concepts in sociological discourse, or else they are analyzed in isolation; abstracted from the Webs of connection in which they are irreducibly embedded. SNA allows us to bring these Webs into view and analyze them in detail, bringing the agency and relationality suggested by Becker's (1974, 1982) reference to "collective action" to the fore. We can map the collective "doing" of social life. In this respect, SNA facilitates a genuinely relational sociology (Crossley 2011).

Use of SNA in music sociology is increasing, with fascinating results (Allington et al. 2015; Crossley 2015a; Crossley and Emms 2016; Crossley et al. 2015; McAndrew and Everett 2015; Millward et al. 2017). Studies to date have tended to focus upon local and virtual worlds, however. The translocal remains largely unexplored. Our paper begins to plug this gap.

DEFINING TRANSLOCAL NETWORKS

The network structure of a translocal world, as we conceive it, is both *multi-leveled*, involving different types of node at different levels of aggregation, and *multiplex*, involving different types of tie between the same nodes. Translocal music worlds are networks of: *individual participants* playing various *roles* (i.e., artists, audiences, support personnel) across multiple *events* (e.g., gigs and festivals) in diverse *spaces* (e.g., venues, studios, and practice rooms) and *localities* (e.g., neighborhoods, towns, and countries) and involving a variety of *artifacts* (e.g., recordings, publications, and Web sites). In addition they may involve *corporate actors*, such as record labels and other firms. And all of these elements are linked in multiple ways. Capturing even a relatively small world in full would be a mammoth task, therefore, and we must proceed incrementally. As a first step in exploring the structure of the translocal underground heavy metal music world (UMW), we focus upon one key dimension of its structure: the network of live music events (gigs and festivals) generated by the flow of audience members between them. That is, we take live events as our network nodes, deeming these nodes to be connected when they share one or more of the same audience members.

Live music events are important, analytically, because they are focal points where participants assemble and engage in activities which, for many of them, are the *raison d'être* of both the UMW and their participation in it. Like the totemic festivities analyzed by Durkheim ([1915] 2015), they are moments in time-space where participants in a world converge and around which they mobilize; occasions that afford them the opportunity to fully enact and live their metal identity, reinforcing that identity and thereby revivifying the UMW. Live music events afford an opportunity to engage in ritual forms of participation, which are only weakly echoed in other contexts and "being there" is an integral part

of the metal identity; a demonstration of commitment and belonging to the metal world. Furthermore, while recordings are important, live performance bestows authenticity within metal culture, affording audiences what they perceive to be unmediated access to the music they love in its pure form. Art, to paraphrase Becker (2004), always happens somewhere, and in the case of the UMW, gigs and festivals are key sites of its happening.

The flow of participants between these events is important for three main reasons. First, it demarcates the boundaries of the world. Adapting a point from DiMaggio (1987), we suggest that just as participants are defined (e.g., as "metal heads") by the music they listen to, so too artists and songs are defined by their appeal to a common audience. Artists belong together, in the same world, in part, because they attract many of the same audience members. There will be overlaps with other worlds, of course, and some audience members will have eclectic tastes, but we would expect the events belonging to any given world to form a distinct network cluster (see also Crossley and Emms 2016).

This boundary-drawing process is useful to the academic researcher. We can be more confident in assigning gigs to a common world when they share an audience. It exists for participants too, however, and plays a role in their intersubjective sense of belonging to a world. Recognizing common faces at gigs both affords them a sense of common belonging and collective identity and reinforces their sense of coherence in their musical preferences. Familiar faces serve as reference groups, signaling by way of their attendance at a gig both that this is *our* kind of music and that *we* constitute a distinct taste community.

It is important to add that attendance at these gigs is generally quite small (mostly <100, often <50). They are not widely advertised, at least not through mainstream channels, and even where adverts do come to the attention of individuals outside of the world they are unlikely to attract participation either because the artists will be unknown or because the distinctive aesthetic of underground metal, both auditory and visual, is unappealing to all but the small circle of its devotees. These small numbers increase the likelihood that regulars will recognize one another at gigs and festivals and indeed, to move on to our second point, will interact and form more durable ties.

Second, repeated copresence at gigs increases the likelihood of ties forming between audience members, facilitating interactions which, in turn, are generative of a world's distinct culture and which contribute to its cohesion. That is, audience members themselves form a network; exchanging ideas and information, and influencing one another. Live events are network "foci," to borrow Feld's (1981) term. They draw metal heads into a common space at a common time for purposes of engaging in a common activity based around a shared passion. This encourages tie/network formation between metal heads, further strengthening their commitment

to and identification with the UMW and giving them an additional incentive to participate. As one participant, echoing many, put it:

> . . . I regularly travel for gigs and festivals. . . . a lot of my friends do the same thing. There are people all over the country into the same music and gigs are not only a chance to hear the music we love but to see good friends and hang out. As massively cheesy as it sounds there is a huge community/family feel to the underground heavy music scene. I look forward to seeing friends as much as I do the bands, so more and more it doesn't matter where we travel to. (Louise, Manchester)

This lends music world networks a "structural duality" in Breiger's (1974) sense; actors link events and events link actors.

Third, the flow of participants between events allows for the diffusion of information, ideas, and influence, generating a common culture and identity across localities. Stories and "memes" originating at one event spread to further events, and to participants at those later events who were not present at the first, by way of participants who were and who link the events. Furthermore, indirect ties are formed between participants who do not attend the same gigs by way of contacts whom they share in common and who broker between them, a process which again lends the UMW structure and cohesion.

METHODOLOGY

Our aim, to recap, is to explore the network structure formed by the flow of audience members between live metal events hosted in different localities (because we believe that this forms an important dimension of the wider network structure of the translocal UMW). To do this, we first compiled a questionnaire survey that asked about attendance at all live UMW events occurring across six U.K. localities (Birmingham, Bristol, Leeds, Liverpool, London, and Manchester) during a three-month period (February–April 2015). Our time-space window was selected on the basis of information gleaned from interviews with tour managers and promoters. They suggested that February to April was the busiest touring period in the United Kingdom because of the underground festivals taking place around that time. Artists try to tour around the festivals, they observed, in order to minimize costs. And they identified our six localities as the main stops on the underground metal touring circuit. We therefore targeted the main sites on the live circuit of the U.K.'s UMW during its busiest period.

Events were identified via metal-related social media and Web sites that archive and advertise event listings. An event was included if it both involved underground metal and fell within our time-space window. In addition, respondents were invited to nominate further events, from within our time-space window, which they had attended (none did). For purposes

of analysis any event with no identified attendees was removed. This gave us 148 events.

The questionnaire was mounted online and distributed via the social media channels of the UMW; the same channels through which we identified events. In addition, respondents were encouraged to pass the link on to others whom they believed might be interested in and prepared to complete the questionnaire. Facebook, in particular, proved to be a useful vehicle for dissemination.

As in many small music worlds, the division of labor between audience, artists, and support personnel is blurred in the UMW and many of our respondents indicated that they play a number of roles. However, they were identified and contacted in their capacity as audience members. Four hundred seventy-four usable responses were generated.

From our survey we constructed an "adjacency matrix" (Scott 2000) indicating which pairs of events shared participants. This matrix was "valued": ties had a strength corresponding to the number of participants each pair of events shared in common. However, for reasons that we discuss below, we also constructed a binary version in which events were deemed to be either tied or not and we used this binary matrix for our analysis.

SNA is mathematically rooted and in that sense quantitative. However, its techniques are not necessarily statistical and where they are differ from standard statistical models, resting upon different assumptions. For example, the case-wise independence assumed in most statistical models is violated when we are analyzing networks because cases (i.e., nodes) are connected. In addition, we do not sample from a population with the aim of inferring back to it, as in conventional statistics. Ideally we conduct a census, albeit usually of a small population, which we analyze in its particularity. The approach is more akin to a case study than a statistical survey.

However, "network friendly" versions of some standard tests and modeling procedures have been developed and we use some of these in the paper. These are usually identical to the standard tests/models except for their tests of significance, which measure the likelihood that findings could have arisen by chance rather than, as in standard statistics, adjudicating on the inference from sample to population.

Our case study comprises all live underground metal events hosted in six cities over a three-month period and we believe that we achieved a census of these events. It is possible that we missed one or two but given the search methods used it is unlikely that we missed many. Our survey respondents only represent a fraction of the attendees at these events and they are a self-selecting sample. For this reason our information about the links between events is open to question. We can be certain that all events that we find to be linked are indeed linked but it may be that other links exist, which we have not found because the participants who link them did not respond to our survey. Likewise, our sense of the strength of ties

between particular events (i.e., the number of participants they share) may be inaccurate. Our analysis is not focused upon individual links, however, but rather upon general patterns of links whose methods of detection and analysis, previous studies suggest (Borgatti, Carley, and Krackhardt 2006; Costenbader and Valente 2003), are sufficiently robust to be unaffected by a number of missing links. Furthermore, we elected to treat ties between events in a binary fashion in order to avoid inaccuracies in tie values and weighting.

A systematic response bias might present us with a misleading picture, but we have no reason to suppose that our response was systematically biased, except perhaps in the respect that keener participants and those more sympathetic to academic research are more likely to have responded; a bias common to all academic research and one unlikely to affect network patterns. We are therefore confident that our findings capture the basic network structure of the U.K.'s UMW.

It is important to add that more systematic ways of sampling participants in the UMW are not available. They form a tiny minority within the general population, such that they would not be captured in random samples of the latter, and no sample frame exists for them. The best that we can do is to work though the communication channels they use to keep informed about events in their world and appeal for their cooperation, which is what we have done. Requests for participation were posted at least three times on each channel we identified.

Our approach to analysis was exploratory and abductive (Peirce 1955). We began descriptively, using our findings at each stage of the analysis to formulate further questions and guide further investigation. This strategy is reflected in the presentation of our results, which builds from basic description to more incisive analysis. All measures and visualizations were generated by UCINET (Borgatti, Everett, and Freeman, 2002) and all statistical tests were performed using UCINET's "network friendly" versions.

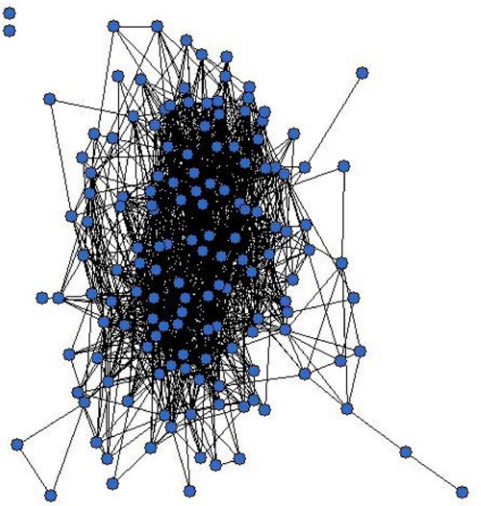
RESPONDENT PROFILE

Of our 474 responses, 74 percent were male. This is interesting given that females are typically more likely to respond to surveys but unsurprising given the strong masculine bias in mainstream metal (Krenske and McKay 2000; Savage 2006; Walser 1993; Weinstein 1991). Sixty percent were university educated, challenging Bryson's (1996) contention that metal appeals to the lower educated. Perhaps underground metal, with its more experimental musical forms, shifts the balance toward the more highly educated, whose education generates interest in experimental cultural forms. Despite their higher education, however, 61 percent were earning below the U.K.'s average annual income of £25K.

The mean age of respondents was 31 (SD = 8). While not old, this suggests that participants are not youths and lends support to the idea that

Figure 2

The Network of Live Events [Color figure can be viewed at wileyonlinelibrary.com]



the support base for popular music is aging (e.g., Bennett 2012; Bennett and Hodgkinson 2012). The "moral career" of music enthusiasts is changing, with a growing number continuing their participation into middle age and/or drifting back when responsibilities of adult life, which may have forced them to withdraw for a time, lessen.

A TRANSLOCAL NETWORK

In Figure 2, we visualize the network of events captured by our survey. With the exception of two "isolates" it forms a single component: every event has a path linking it to every other event. Moreover, mean path lengths are short (2.2 "degrees"[1]), with over 70 percent of nodes being either directly connected or linked by a single intermediary. In addition, each event is linked, on average, to 21 other events. Cumulatively, these measures suggest a cohesive network as we would expect for a music world. It only makes sense to speak of a "world" when events (or participants)

1. A degree, in this context, is a tie between two nodes. If two nodes are linked by a single intermediary then they are at "two degrees of separation."

are concretely connected in a relatively close-knit manner. However, the standard deviation for number of connections is relatively high (16), suggesting that some events are much better connected than others, and there is evidence of a high level of clustering (clustering coefficient = .66), suggesting that we might find distinguishable subgroups within it. In what follows, we pursue these ideas further, beginning by looking at the impact of geography upon clustering.

In Figure 3, we cluster nodes by locality and in Table 1, we indicate both how many of the 148 events each locality hosted and the density of connection within and between localities; that is, the number of ties observed, expressed as a proportion of all potential ties (Wasserman and Faust 1994).

The density of within-locality ties (on the shaded diagonal of Table 1) is considerably higher in all cases than that for between-locality ties, suggesting that nodes cluster by locality and this "locality effect" is confirmed by UCINET's E-I index[2] (bottom left of Table 1), which indicates that the probability of this clustering arising by chance is tiny. This is not surprising but it confirms the existence of our six local metal worlds. Moreover, the relatively high density for each locality suggests that each constitutes a cohesive local world.

Each locality enjoys some connection with every other locality, however, indicating that these local worlds combine in a translocal structure. Some audience members are attending gigs in multiple localities, connecting those localities. More interestingly, not all localities are equal. Manchester, in particular, stands out because it has relatively strong ties to Leeds, Liverpool, London, and, to a lesser extent, Birmingham, while these four localities do not have strong ties to one another. Manchester appears to occupy a hub position in the network. This is also suggested by Figure 3. The software has located the Manchester cluster toward the middle of the plot, with others in a circle around it, because this cluster is involved in a relatively high proportion of the translocal connections.

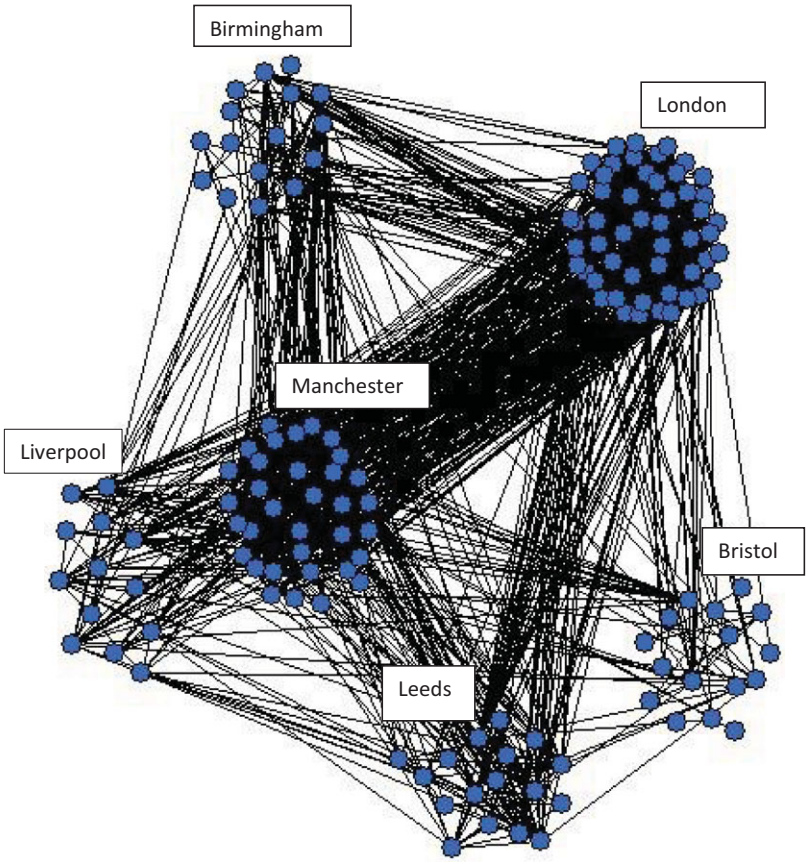
We suggest three explanations for this centrality. First, Leeds and Liverpool are close (geographically) to Manchester relative to the distances between the other localities and travel is cheap, easy, and quick. We would expect greater movement between Manchester and these two localities on a purely cost/benefit basis.

Second, although Manchester hosted fewer events than London, it hosted at least double the amount of any of the other localities (see Table 1). More is happening in Manchester and this attracts audiences from other localities, either to see artists who are not playing in their own locality or to satiate a general desire for live metal which cannot be satisfied within their own locality. This explanation is supported by the first

2. Which captures the ratio of in-group to between-group ties.

Figure 3

The Network of Live Events Clustered by Location [Color figure can be viewed at wileyonlinelibrary.com]



author's qualitative interviews. Several interviewees, based in different localities, identified Manchester as a particularly exciting locality for gigs:

> I try and make it over to Manchester as often as possible, there's some really cool stuff going off over there and places like Islington Mill and Soup Kitchen are doing a stand up job. (Miles, Leeds)

Table 1

Events per Locality and Within/Between Locality Densities (Number of Events Hosted per Locality in Parentheses)

	Birmingham	Bristol	Leeds	Liverpool	London	Manchester
Birmingham (16)	.32					
Bristol (16)	.02	.14				
Leeds (17)	.03	.02	.43			
Liverpool (13)	.05	.02	.06	.18		
London (52)	.07	.03	.07	.06	.36	
Manchester (34)	.09	.04	.11	.14	.14	.42

Notes: Expected E-I: 0.57; observed E-I: −0.115, $p = .000$.

> Manchester is a lot better than Coventry/Birmingham in pretty much all cases, attendance, cost and venues. (Gemma, Birmingham)

> Manchester ... right now it is thriving. It is very active, at times almost too active! There is something every week, if not more. (Louise, Manchester)

The reason why Manchester is able to host more gigs, the qualitative data suggest, is that it has a "critical mass" of participants, necessary to make gigs and festivals successful, which is lacking in some localities (on critical mass and music worlds, see Crossley 2015b):

> ... dedication and crowd size/participation seems stronger in Manchester than elsewhere. I have been to half empty gigs in Birmingham and have local friends there who have often felt embarrassed by the lack of support for touring underground bands. This is something I rarely encounter in Manchester. (Louise, Manchester)

This dynamic is no doubt amplified by a feedback effect. Critical mass makes more events possible, which attracts audiences from other localities, who, as they become regular visitors, contribute to the locality's critical mass.

This begs the question why Manchester appears as a hub in our table and not London, given that London hosts even more events? Perhaps Manchester's appeal is the combined effect of the events it hosts and its geographical convenience? However, we should also consider that density tends to decrease with size; the more nodes in a network, the less likely it is, all things being equal, that a high proportion of them will be connected. In other words, there may be too many live events in London for most people to get to a high proportion of them. If this is so, then Table 1 may be disguising the fact that London too is a hub in the U.K.'s UMW. We test this claim in the next section.

Third, a strong theme to emerge in the first author's qualitative research was the importance of festivals. Many audience members, particularly those with family and work responsibilities, found festivals to be a cheap and efficient way of getting to see a large number of the artists they wanted to see:

> Personally think the huge upsurgance in festivals, all-dayers and things is a symptom of the economy. The fact that no one has any money. Regular gigs are becoming a bad deal. Why pay five pounds for four bands when you can pay ten pounds for eleven bands? (Benjamin, Liverpool)
>
> I find a lot of people nowadays will hold off on shows and just do several festivals a year as they can see everyone all in one go. (Hannah, Birmingham)

Indeed, many promoters expressed concern that festivals were diverting audiences away from ordinary gigs, so much so that they were introducing clauses into contracts specifying that artists would not play nearby festivals within a given period. "All-Dayers," typically held on a Saturday, were particularly popular because audiences felt able to throw themselves fully into the event, in the knowledge that they could recover on the Sunday before returning to work. Festivals were not only valued for economic and musical reasons, however. They were also perceived as a good opportunity to meet up with friends and have the time to catch up:

> It's as much about the people who are going to be there – you know, your community is going to be in one place. It's centralizing one core group of people essentially for a large amount of time. (Tim, Leeds)

As festivals are annual events that the same people regularly turn up to, moreover, they become associated with this opportunity and relied upon; regular events in participants' own yearly routines.

The significance of this is that we identified six festivals in our survey and three were held in Manchester, including two well-established events focused upon "sludge" and "stoner" metal: the Tombstone all-dayer and Desertfest, a three-day festival. Perhaps the attraction of Manchester is its festivals. Of the remaining three festivals, moreover, two were in London. This again suggests that we should explore London's potential hub status.

CORE AND PERIPHERY

To further explore the hub idea, we fitted a core/periphery model. This is an idealized network configuration in which: (1) a subset of nodes (the core) are distinguished from the rest (the periphery) by the relatively high density of connection between their members and (2) ties between core and periphery are denser than those between members of the periphery. The periphery are thus defined by their marginal attachment to the core. They do not form a separate, cohesive group.

Table 2

Core and Periphery Densities

All nodes			Festivals removed		
	Core	**Periphery**		**Core**	**Periphery**
Core ($n = 58$)	.47	.11	Core ($n = 51$)	.44	.1
Periphery ($n = 90$)		.04	Periphery ($n = 91$)		.04

UCINET affords two ways of pursuing this idea empirically. There is a categorical, optimizing procedure that seeks out the binary partitioning of nodes, which most closely conforms to a core/periphery structure, producing summary measures that allow the researcher to judge whether it conforms closely enough to qualify. This is a useful procedure for determining whether we have a core/periphery structure, but its binary divide can separate nodes whose position in the network differs only slightly. Alternatively, we can measure the "coreness" of each node. This measure is continuous and therefore denies us a neat core/periphery divide but it allows a more sensitive comparison of nodes.

Exogenous node attributes, such as "locality," play no part in either of these procedures. Core membership is determined exclusively by a node's pattern of ties. However, having decided upon a node's core/periphery status, we can then consider any relation it may have to such attributes.

Given their complementary strengths and weaknesses we employed both of the above procedures. We began with the categorical procedure, running it twice; once with the whole network and once with festivals removed, in order to gauge their effect. The results are given in Table 2. The left side of the table shows that the algorithm identified a core of 58 events and that the density of ties between these events is 0.48 (48 percent of all potential ties between core events are actualized). The remaining 90 events, which comprise the periphery, have .04 density and their density of ties to the core is .11. This represents a strong core/periphery structure and the right-hand side of the table indicates that little is changed when festivals are removed. This is an interesting finding because it suggests that not all events in the translocal UMW are equally as important, at least in structural terms. Some events are more important than others, forming a hub in the network. This begs a further question, however, of whether this divide maps onto locality.

Turning to Table 3, where we cross-tabulate core/periphery membership with locality (and compare mean "coreness" scores), it is clear that it does. Manchester and London predominate within the core. Moreover, though Manchester's representation drops a little when its festivals are

Table 3

Local Worlds Compared

	Proportion of events in core		Proportional contribution to core		Mean coreness (with ANOVA)	
	All (percentage)	Minus festivals (percentage)	All (percentage)	Minus festivals (percentage)	All	Minus festivals
Birmingham	25	13	7	4	.04	.04
Bristol	0	0	0	0	.01	.01
Leeds	12	19	3	6	.04	.04
Liverpool	8	0	2	0	.04	.04
London	58	58	52	57	.09	.09
Manchester	62	53	36	33	.09	.09
					$F = 13.34$, $p < .000$	$F = 13.35$, $p < .000$

removed, it is only a little. Manchester is a "core" locality with or without its festivals.

FESTIVALS

Festivals are important, however. We compared them with ordinary gigs, using *t*-tests, for: (1) number of attendees; (2) number of connections; (3) coreness; and (4) geographical homophily.[3] In all cases, we found a large, statistically significant difference. Festivals attract bigger audiences. They have many more connections within the network. They have a much higher coreness. And they are much more likely to be connected to events outside of their own locality. This corroborates our qualitative observations regarding audience preferences for festivals and suggests that festivals play an important role in generating translocality. Audiences are more likely to travel to festivals in other localities than to gigs.

VIRTUALS, LOCALS, AND TRANSLOCALS

Deepening this analysis further, we turned to audiences (see Table 4). A much higher number of our respondents had attended events in Manchester and London and the proportion of attendees in these two locations who attended events in that locality only was much higher. Our interpretation of this is that metal enthusiasts outside of Manchester and London

3. That is, the tendency to connect disproportionately to other events in one's own locality, as tested by the aforementioned E-I index.

Table 4

Participants and Localities

	Number of participants by locality		Proportion exclusive to locality	
	All	Minus festivals	All (percentage)	Minus festivals (percentage)
Birmingham	34	34	21	38
Bristol	23	23	30	30
Leeds	35	32	12	16
Liverpool	23	23	13	17
London	137	108	39	46
Manchester	166	145	48	58

are less likely to be satisfied with the range of live events available in their locality and therefore more likely to travel, whereas those in Manchester and London can often fully satisfy their desire for metal in their locality and are less likely to travel. Audiences travel when their desire for participation exceeds opportunity in their immediate locality. This is not the only factor explaining translocal travel, however.

Two hundred fourteen of our 474 respondents attended no events. We label them "Virtuals" because, from the point of view of our survey, their participation is virtual only. They engage with Web sites and social media but do not attend gigs. Their participation may not be entirely virtual of course. They may frequent "metal pubs," attend mainstream metal gigs and may have attended underground metal events outside of our time-space window. We have no evidence of this, however, and will therefore assume, for present purposes, that their participation is exclusively virtual. A further 153 of our respondents attended gigs in one locality only. We label these "Locals"—with the same caveat. Our final group, comprising 107 respondents, attended gigs in more than one locality. We call them "Translocals" because their gig-going connects localities and generates translocality.

In Table 5 we cross-tabulate these categories with other respondent characteristics. Our types do not differ in age or income. Virtuals are slightly more likely to be highly educated, which is counterintuitive as higher education is often associated with greater levels of participation (Bennett et al. 2009), but the difference is not great. Similarly, they are slightly less male dominated, which makes sense in terms of what some writers have said about the hypermasculine environment of the metal gig and the discomfort this causes some female participants (Krenske and McKay 2000), but again the difference is slight. Where we find big

Table 5

Virtuals, Locals, and Translocals

	N	Percentage of male	Percentage of higher educated	Percentage of below mean U.K. income	Mean age	Mean gigs attended	Percentage with artist or support role
Virtuals	214	71	65	61	32	0	27
Locals	153	76	59	58	31	2.9	52
Translocals	107	77	52	63	30	5.8	63
All	474	74	60	61	31	2.25	46

differences are in mean gigs attended and participation in artist/support roles. Locals are much more likely than Virtuals to take on such a role, and translocals much more likely than locals.

Again this suggests that translocal travel is an effect of desire for participation. Number of gigs attended and willingness to take on an artist or support role are both indications of this desire. Translocality, of the type we are exploring here, is an effect of a desire for participation which exceeds what can be accommodated within a single locality.

CONCLUDING DISCUSSION

In this paper, we have extended and advanced the music worlds research agenda by using formal SNA to analyze the U.K.'s UMW. Clarifying Peterson and Bennett's (2004) schema, we have suggested that the local, translocal, and virtual are not mutually exclusive types of music world but rather aspects that may coincide in different combinations in specific cases.

Building upon this, we have further suggested that translocal worlds are typically concatenations of local worlds; geographically dispersed networks that contain, within them, geographical clusters corresponding to specific local worlds. Figure 3 offers a visualization of this idea, derived from our data.

Music world networks are both multileveled and multiplex. They involve multiple types of node, any two of which may be linked in many different ways simultaneously. Among the ways in which local worlds are concatenated, to form translocal worlds, however, we have suggested that traveling fans play an important role; moving between localities in order to see artists who are not playing in their own locality or else to increase the overall volume of shows they are able to attend, and forging a link between the localities they visit in the process.

This is the lead we have followed in this paper, and our suggestion has borne fruit. The geographical distribution of enthusiasm for underground metal around the United Kingdom has generated a number of local UMWs, particularly, if Crossley (2015b) is right, in localities with the critical mass and network of enthusiasts necessary to build such a world. And these local worlds are connected, forming a translocal world, by traveling audience members. Not all fans travel. Only those whose desire to participate exceeds opportunity within their locality. However, some do and they play a key role in linking the UMW up, translocally.

Not all events and localities are equal in a translocal world, however. We found clear evidence of a core-periphery structure. Some events and localities are more important than others. Furthermore, core localities host considerably more events than the rest. There is a geopolitics to translocality.

Why some localities become core and others peripheral is a question that we have neither the space nor data to address. However, critical mass and the feedback loops that amplify its effects might again be important (Crossley 2015b). Manchester and London seemingly have bigger pools of underground metal enthusiasts, furnishing them with sufficient organizers and audiences for a greater number of events than other localities. And the sheer fact of putting on more gigs will, via processes of both recruitment (within the local population) and migration (of enthusiasts from elsewhere), swell the number of enthusiasts within these cities, enabling their elevated volume of live events to continue.

Core events and localities are important to the generation of translocality because they create a gravitational pull, drawing enthusiasts from peripheral worlds into them. They are "hubs," accounting for a significant amount of the traffic between worlds. It is audiences from peripheral localities who do the work of generating translocality, however, by traveling into the core to attend gigs. And they tend to travel, to reiterate, because core localities afford them access to a range and volume of gigs unavailable in their own locality.

Festivals too play a role in this process. They have a greater pulling power than ordinary gigs and enthusiasts are more likely to travel between localities to attend them. They also tend to occur in core localities, however, perhaps because promoters are more confident of making a success of them in these localities. This further contributes to the "coreness" of the core.

There is surely much more to be said about traveling audiences and their contribution to the generation of translocal worlds. Furthermore, local worlds are linked up in other ways than those we have examined; by traveling bands, for example; by support personnel, such as promoters, who work across localities; and by labels and Web sites which service participants across a wide geographical space. We have at least opened up the analysis of translocality here, however, providing some interesting observations for further work to build upon and illustrating a relational methodology (SNA) that, we believe, is invaluable for such work.

There are many ways to study music worlds. Different methods are necessary to capture their different aspects and we have combined aspects of qualitative and quantitative research in this paper because of this. As noted earlier in the paper, however, we believe that SNA is vital for research in this area because music worlds are relational structures and SNA is the best available "toolbox" for capturing both relationality and structure. Many researchers recognize that worlds or "scenes" are networks but this gets us nowhere if we allow "network" to remain a vague place-marker for who knows what. SNA renders "network" as a precise and powerful concept and we should embrace this.

References

Adorno, T. 1976. *Introduction to the Sociology of Music*. New York: Continuum.

Allington, D., B. Dueck and A. Jordanous. 2015. "Networks of Value in Electronic Music." *Cultural Trends* 24(3):211–22.

Banks, M. 2012. "MacIntyre, Bourdieu and the Practice of Jazz." *Popular Music* 31(1):69–86.

Becker, H. 1974. "Art as Collective Action." *American Sociological Review* 39(6):767–76.

Becker, H. 1982. *Art Worlds*. Chicago, IL: Chicago University Press.

Becker, H. 2004. "Jazz Places." Pp. 17–29 in *Music Scenes: Local, Translocal, and Virtual*, edited by A. Bennett and R.A. Peterson. Nashville, TN: Vanderbilt University Press.

Becker, H. 2006. "A Dialogue on the Ideas of 'World' and 'Field' with Alain Pessin." *Sociological Forum* 21:275–86.

Bennett, A. 2012. *Growing Old Disgracefully*. Philadelphia, PA: Temple University Press.

Bennett, A. and P. Hodgkinson. 2012. *Ageing and Youth Cultures*. New York: Berg.

Bennett, T., M. Savage, E. Silva, A. Warde, M. Gayo-Cal, and D. Wright. 2009. *Culture, Class, Distinction*. London: Routledge.

Bin Quader, S. and G. Redden. 2015. "Approaching the Underground." *Cultural Studies* 29(3):401–24.

Borgatti, S.P., K.M. Carley and D. Krackhardt. 2006. "On the robustness of Centrality Measures under Conditions of Imperfect Data." *Social Networks* 28(2):124–36.

Borgatti, S.P., M.G. Everett and L.C. Freeman. 2002. *UCINET 6 for Windows: Software for Social Network Analysis*. Harvard, MA: Analytic Technologies.

Bottero, W. and N. Crossley. 2011. "Worlds, Fields and Networks." *Cultural Sociology* 5(1):99–119.

Bourdieu, P. 1993. *The Field of Cultural Production*. Cambridge: Polity.

Breiger, R. 1974. "The Duality of Persons and Groups." *Social Forces* 53(2):181–90.

Bryson, B. 1996. "Anything But Heavy Metal." *American Sociological Review* 61(5):884–99.

Cormany, D. 2015. "Coachella Fans, Online and Translocal." *Journal of Popular Music Studies* 27(2):184–98.

Costenbader, E. and T. Valente. 2003. "The Stability of Centrality Measures When Networks Are Sampled." *Social Networks* 25(4):283–307.

Crossley, N. 2011. *Towards Relational Sociology*. London: Routledge.

Crossley, N. 2015a. "Body Techniques and Music Worlds: The Embodiment of Musicking." *Cultural Sociology* 9(4):471–92.

Crossley, N. 2015b. *Networks of Sound, Style and Subversion: The Punk and Post-Punks Musical Worlds of Manchester, London, Liverpool and Sheffield 1976–1980*. Manchester: Manchester University Press.

Crossley, N. and W. Bottero. 2015a. "Music Worlds and Internal Goods." *Cultural Sociology* 9(1):38–55.

Crossley, N. and W. Bottero. 2015b. "Social Spaces of Music: An Introduction." *Cultural Sociology* 9(1):3–19.

Crossley, N. and R. Emms. 2016. "Mapping the Musical Universe: A Blockmodel of UK Music Festivals 2011–13." *Methodological Innovations* 9(1):1–14.

Crossley, N., S. McAndrews and P. Widdop. 2015. *Social Networks and Musical Worlds*. London: Routledge.

DiMaggio, P. 1987. "Classification in Art." *American Sociological Review* 52(4):440–55.

Dowd, T., K. Liddle and J. Nelson. 2004. "Music Festivals as Scenes." Pp. 149–67 in *Music Scenes: Local, Translocal, and Virtual*, edited by A. Bennett and R.A. Peterson. Nashville, TN: Vanderbilt.

Durkheim, É. [1915] 2015. *Elementary Forms of the Religious Life*. New York: Free Press.

Elafros, A. 2013. "Greek Hip Hop: Local and Translocal Authentication in the Restricted Field of Production." *Poetics* 41:75–95.

Emms, R. 2017. "Live Underground Heavy Metal: The Perseverance and Decline of an Art World." PhD thesis, University of Manchester, Manchester.

Feld, S. 1981. "The Focused Organisation of Social Ties." *American Journal of Sociology* 86:1015–35.

Finnegan, R. 1989. *The Hidden Musicians*. Cambridge: Cambridge University Press.

Futrell, R., P. Simi and S. Gottschalk. 2006. "Understanding Music in Movements." *Sociological Quarterly* 47(2):275–304.

Gilmore, S. 1987. "Coordination and Convention." *Symbolic Interaction* 10(2):209–27.

Gilmore, S. 1988. "Schools of Activity and Innovation." *Sociological Quarterly* 29(2):203–19.

Harris, K. 2000. "Roots?" *Popular Music* 19(1):13–30.

Hesmondhalgh, D. 2005. "Subcultures, Scenes or Tribes." *Journal of Youth Studies* 8(1):21–40.

Hield, F. and N. Crossley. 2015. "Tastes, Ties and Social Space: Exploring Sheffield's Folk Singing World." Pp. 189–216 in *Social Networks and Music Worlds*, edited by N. Crossley, S. McAndrew and P. Widdop. London: Routledge.

Hodkinson, P. 2004. "Translocal Connection in the Goth Scene." Pp. 131–48 in *Music Scenes: Local, Translocal, and Virtual*, edited by A. Bennett and R.A. Peterson. Nashville, TN: Vanderbilt.

Kahn-Harris, K. 2007. *Extreme Metal*. Oxford: Berg.

Keil, C. 1966. *Urban Blues*. Chicago, IL: University of Chicago Press.

Krenske, L. and J. McKay. 2000. "Hard and Heavy." *Gender, Place and Culture* 7(3):287–304.

Kruse, H. 1993. "Subcultural Identity in Alternative Music Culture." *Popular Music* 12(1):33–41.

Kruse, H. 2003. *Site and Sound*. New York: Lang.

Lopes, P. 2002. *The Rise of the Jazz Art World*. Cambridge: Cambridge University Press.

Ma, E. 2002. "Translocal Spatiality." *International Journal of Cultural Studies* 5(2):131–52.

Madrid, A. 2006. "Dancing with Desire." *Popular Music* 25(3):383–99.

Martin, P. 2005. "The Jazz Community as an Art World." *Jazz Research Journal* 2. Retrieved November 30, 2016 (https://www.equinoxpub.com/journals/index.php/JAZZ).

Martin, P. 2006. "Musicians Worlds." *Symbolic Interaction* 29(1):95–107.

Martin-Iverson, S. 2014. "Bandung Lautan Harcore." *Inter-Asia Cultural Studies* 15(4):532–52.

McAndrew, S. and M. Everett. 2015. "Music as Collective Invention." *Cultural Sociology* 9(1):56–80.

Millward, P., P. Widdop and M. Halpin. 2017. "A 'Different Class'? Homophily and Heterophily in the Social Class Networks of Britpop." *Cultural Sociology* 11(3):318–36.

Negus, K. 1999. *Music Genres and Corporate Cultures*. London: Routledge.

Newton, F. 1961. *The Jazz Scene*. Harmondsworth: Penguin.

O'Neill, A. 2017. *A History of Heavy Metal*. London: Headline.

O'Shea, S. 2015. "Embracing Difference in Feminist Music Worlds." Pp. 122–44 in *Social Networks and Musical Worlds*, edited by N. Crossley, S. McAndrews and P. Widdop. London: Routledge.

Peirce, C.S. 1955. "Abduction and Induction." Pp. 150–56 in *Philosophical Writings of Peirce*, edited by J. Buchler. New York: Dover.

Peterson, R.A. and A. Bennett. 2004. "Introducing Music Scenes." Pp. 1–16 in *Music Scenes: Local, Translocal, and Virtual*, edited by A. Bennett and R.A. Peterson. Nashville, TN: Vanderbilt.

Savage, M. 2006. "The Musical Field." *Cultural Trends* 15(2-3):159–74.

Scott, J. 2000. *Social Network Analysis: A Handbook*. London: Sage.

Small, C. 1998. *Musicking*. Middletown: Wesleyan University Press.

Solomon, T. 2009. "Berlin-Frankfurt-Istanbul." *European Journal of Cultural Studies* 12(3):305–27.

Straw, W. 1991. "Systems of Articulation, Logics of Change." *Cultural Studies* 5(3):368–88.

Thornton, S. 1995. *Club Cultures*. Cambridge: Polity.

Toynbee, J. 2000. *Making Popular Music*. London: Arnold.

Walser, R. 1993. *Running with the Devil*. Middletown, CT: Wesleyan University Press.

Wasserman, S. and K. Faust. 1994. *Social Network Analysis*. Cambridge: Cambridge University Press.

Weinstein, D. 1991. *Heavy Metal*. New York: Lexington.