

Jazz and the Disconnected: City Structural Disconnectedness and the Emergence of a Jazz Canon, 1897–1933¹

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The study of organizations and markets suffers from the underdevelopment of disconnected producers. This article emphasizes the imputed identities of sources to argue that difficult-to-categorize outputs were appealing when associated with a source high in disconnectedness. Worldwide data on recordings and mobility with detailed data on Midwest recordings provide evidence that jazz from cities high in disconnectedness was rerecorded more often by musicians over time. Moreover, recordings with difficult-to-categorize elements were more likely to be rerecorded when coming from cities high in disconnectedness, despite evidence that original music was paradoxically less likely to come from these cities.

THE INFLUENCE OF THE DISCONNECTED: ADDRESSING A THEORETICAL UNDERDEVELOPMENT

Within the study of markets, socially distant or disconnected actors are recognized but undertheorized, leaving us with a surprisingly thin un-

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derstanding of the sociology of disconnectedness. That is, we have developed theory on how accumulated advantages from highly connected actors can occur independently of the intentions of those highly connected actors (Merton 1957, 1968; Podolny 1993). Disconnected actors, however, lack a comparable level of theoretical development, with theory restricted to cases in which less connected actors are strategically radical or innovative (Schwartz 2002; Singh and Fleming 2010). We do not have a broader framework for understanding disconnectedness, especially when meaning and value are driven by the interpretation of actions rather than the intention of those actions.

In this article, I focus on how disconnectedness can have a unique role in social systems, particularly in innovation-based social systems familiar to scholars of organizations and markets (e.g., cultural markets, technological systems). Despite the explicit role that structural perspectives have played in organizational and economic sociology, too little of this work has engaged the role of disconnected actors. At the same time, there is much evidence to suggest that disconnectedness plays a critical role when disconnected actors are seen as socially distant or dissimilar, such as members of subcultures (e.g., Becker 1951; Hebdige 1979), those considered exotic and foreign (Griswold 1987; Babon 2006; Johnston and Baumann 2007; Cheyne and Binder 2010), or artists who are economically and psychologically disadvantaged (Price 1989; Fine 2004).

What is missing, however, is a structural account that brings the role of the exotic, foreign, and “authentic outsider” (Fine 2003) under a single concept—what I refer to as “disconnectedness.” I expand a structuralist approach on social network positions using scholarship on the reception of cultural objects (products) to show that objects from disconnected sources can be more appealing, particularly when the outputs in question are difficult to categorize. This congruent match between (disconnected) sources and (difficult-to-categorize) outputs is the key mechanism that underlies my theoretical framework. Accordingly, this study makes four broad contributions. First, building on scholarship on the social structure of creativity (e.g., Becker 1982; Bourdieu 1996), I articulate the role of disconnectedness in innovation-based social systems by arguing and providing evidence that (geographically) disconnected actors are more likely to be appealing sources of cultural objects (cf. Price 1989; Connell and

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Gibson 2003). Moreover, their “advantage” is not in the production of innovative or novel cultural objects, but in the objects’ reception (Griswold 1987; Johnston and Baumann 2007).

Second, I introduce a definition of disconnectedness that requires an understanding of the overall social structure that takes absent relationships into account structurally. Indeed, Simmel’s (1950, p. 143) discussion of the “stranger,” whose disconnectedness allows the stranger to bring “qualities into” a social system “that are not, and cannot be, indigenous to it,” links to insights into the concept of disconnectedness as dynamic—implying that there are degrees of disconnectedness that are a function of both the individual and the structure of the focal group (p. 119). Disconnectedness is not merely a function of the focal actor’s lack of relationships, but also the interconnections of those alters the focal is disconnected from. It is not enough to say that I am disconnected from a group unless we also consider how well that group is itself interconnected.

Third, I use disconnectedness to explain a process by which certain outputs of socially distant actors are valued, which allows us to more cleanly examine the imputed meaning and value of cultural objects. This will drive us closer to a structural framework for understanding how outputs from disconnected actors are evaluated and how the evaluations ultimately affect the evolution of art worlds and innovation-based markets.

Fourth, the theoretical gap that motivates this study has been complemented by a paucity of intuitive methodological tools for assessing an actor’s disconnectedness in a way that is distinct from centrality or network isolation. Methodologically, even when scholars have offered solutions that capture disconnected actors (Bavelas 1950; Moxley and Moxley 1974; Schilling and Phelps 2007), there is relatively little conceptual development to match. Moreover, these solutions typically conflate disconnectedness and isolation in ways that unnecessarily restrain sociological theorizing. Thus, developing a better understanding of the role of disconnected actors requires a simultaneous engagement on theoretical and methodological fronts. This article is an attempt at that engagement through the examination of jazz recordings from cities embedded in the worldwide social structure of early jazz musician mobility.

Expanding a Structuralist Approach

Simmel’s (1950) work on the *tertius* and Burt’s (1982, 1992) studies on structural autonomy offer atypical structural positions that act independently of structural and normative constraints. Subsequent work has often emphasized the strategic intentions of focal actors; however, both Simmel (1950, p. 143) and Burt (1992) point out that often it is the interpretation

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of actions and not necessarily intentions that drives differences in influence and attainment. Similarly, Padgett and Ansell (1993) note that the “structurally contradictory position” of the Medici family, which is discussed as a type of brokerage position, affected how the Medici’s actions were interpreted by the oligarchs (pp. 1305–6). The actions of alters such as the oligarchs then led to the Medici’s “self-awareness” through a robust identity and multivocality. In Fernandez and Gould’s (1994) study of the role of the government as broker, the interpretation of a government agency’s actions was partially contingent on the type of brokerage position the agency occupied. In short, there is ample evidence that the influence of central actors is partially due to the imputed meaning of their actions.

As a complement to these insights on the imputed meaning of central actors, I call attention to the fact that an actor’s output is also imputed when that actor is socially dissimilar (or disconnected). I believe that this argument, bolstered with well-rooted scholarship on the imputed meaning and value of cultural outputs from socially distant sources (Griswold 1987; Price 1989; Fine 2004; Babon 2006; Johnston and Baumann 2007; Cheyne and Binder 2010), allows us to consider the value of disconnected actors’ outputs. This literature draws attention to actors who are defined by the structure of relationships they lack rather than the relationships they have. In settings that reward novelty, dissimilar, distant, and distinct actors are more likely to have outputs successfully labeled as exotic (Johnston and Baumann 2007) and more highly valued precisely because they are removed and “free” from connections to others (see Cheyne and Binder [2010] for the value of foreignness in hip-hop). For example, Fine (2003, 2004) draws out the implications for being disconnected when understanding authenticity within the world of self-taught (“outsider”) art. In his rich ethnographic study, he finds that self-taught artists represent a social (network) position and identity defined by the lack of connections: “Within the art market, they [self-taught artists] lack *social capital*, ties to elite communities, and are not fully integrated professionals in this mainstream art world. It is their *lack* of, rather than their attributes, that defines them . . . their reputation to be established by others” (p. 156; italics retained from the original text). It is this combination of a structural view of an actor outside of a social system with research on how value and meaning of such an actor can be constructed independent of that actor’s intentions that forms the foundation of my key proposition. That is, I suggest that disconnectedness, as a network characteristic, positively affects alters’ interpretation of a cultural producer’s actions independent of that producer’s intentions.²

² Peterson (1997) is key among those who offer parallel arguments within their work on authenticity, and Becker (1982) provides insights into understanding reputation in

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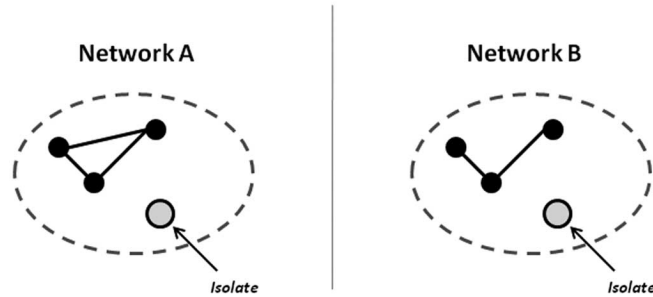


FIG. 1.—Two isolated actors, two different implications for social structure and action

A Motivating Example

Figure 1 provides a motivation for us to consider disconnectedness as a distinct sociological construct. The figure displays two network structures, A and B. They share in common an isolate (the larger unconnected circle with the grey center). Whether it be core-periphery or small world perspectives (Watts 1999), most theoretical and empirical approaches treat the two isolates similarly: both are network isolates to the larger component of three connected actors. Many scholars, when seeking to understand the network structure of a social system, disregard isolates altogether.

However, the two isolates are not similarly situated, and this difference is important when we are interested in evaluations of an actor's actions and outputs. We should not expect the same association between social structure, action, and evaluation for the two isolates in networks A and B. The isolate in network A is on the outside of a clique and is likely viewed as having an identity distinct from members of that clique in at least one of two ways. First, its social position and role identity may be due to conflict between the isolate and the clique, where the isolate is defined explicitly in opposition to the clique or triad (Simmel 1950). Alternatively, the disconnected actor may have a distinct and independent identity orthogonal to the members of the clique (e.g., Becker's [1997] "outsider"). In this second case, the identity of the isolate is interpreted by other members of the social system as a distinct "other": not oppositional to the clique but also not similar to any of the connected members of the social system. I focus on this second case since it more closely corresponds to my context of early jazz, where global social organization

art worlds as well. However, Fine (2003) is particularly explicit in linking the authenticity and appeal of a producer's outputs to the social structural position of the cultural producer.

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was still emergent and few fixed identities had evolved sufficiently for oppositional identities to form (Amburgey et al. 2008).

Returning to network B on the right side of figure 1, we also observe a network with an isolate as in network A. However, here the other three nodes are not the interconnected triad observed in network A. Indeed, Simmel (1950) would suggest that network B features two types of actors: *tertius gaudens* and the “isolated individual” (see also Kanter and Khurana 2009). The *tertius gaudens* reflects the position of the node that serves as an intermediary between two disparate nodes. This intermediary is unencumbered by constraints associated with network closure (Coleman 1988) and has the capability of innovating through the unique integration of knowledge (Burt 2005). In my study, some cities serve as central intermediaries between other cities, and I will examine their influence on the evolution of jazz.

The isolate in B (referred to as isolate B), as in network A (referred to as isolate A), is unencumbered as well from Simmel’s (1950) standpoint. But we cannot expect that the resulting social action and evaluation in network B would be equivalent to that in network A. Isolate B is less disconnected than isolate A. Its isolation is less striking, and with it there is a reduced likelihood that its identity is equally distinct from the other nodes in network B. In other words, *isolate B is less structurally disconnected than isolate A*. This observation is key, as I use it to distinguish my approach from other approaches that attempt to capture disconnected members of a social structure.

The Central Argument

I articulate the conceptual model and mechanism that lie at the center of this article in three components. First, conditional on a cultural producer producing a new product, an audience’s (whether they be peers, critics, or third-party consumers) appeal for that product is driven by how its members impute value and meaning from the producer’s level of disconnectedness. In markets in which uniqueness is given salience, disconnected producers have a novelty, foreignness, or exoticism advantage (Martin 1995; Connell and Gibson 2003; Fine 2004; Cheyne and Binder 2010). To the extent that outputs with appeal influence the creation of a genre’s canon (Crawford and Magee 1992; Block 1997; see also *Harvard Law Review* [2005] on the jazz canon and copyright law), disconnected producers also have a disproportionate influence on canon creation.³ Sec-

³ Consistent with work within ethnomusicology, I will be focusing on the *discographical* jazz canon: the set of songs that come to be associated with the genre as indicated by how frequently they are recorded over time (Pond 2003, p. 17). These songs are regarded

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ond, I argue that disconnectedness is associated with one's membership within a social system but outside interconnected alters. Those higher in disconnectedness, even if locally central, are more clearly outside a set of interconnected alters. Third, I claim that alters' appeal for the outputs of disconnected producers is greater when the outputs are also difficult to categorize since they are more congruent with disconnectedness (Menon and Pfeffer 2003; Phillips 2003). We expect someone who is unique to produce something that is unusual, and this congruence improves the salience and appeal of difficult-to-categorize outputs.

I seek to test my thesis in the context of early jazz by drawing attention to the role of cities as sources of music. Here, cities differ to the extent that they are disconnected. I expect to find evidence not only that, all else equal, recordings from cities high in disconnectedness are more appealing to musicians over time but that the appeal is greatest when the musical recording is difficult to categorize.

JAZZ'S EMERGENCE AND THE INFLUENCE OF DISCONNECTED CITIES

The emergence of recorded jazz provides a unique opportunity to explore how structural disconnectedness can affect a social system. First, examining emerging cultural markets allows one to observe the active construction of a market as well as a dynamic social structure (Becker 1982; DiMaggio 1982, 1987; Lopes 2002; Dowd 2003; Roy 2004). Learning more about emerging social structure in markets allows us to further our theoretical understanding of market role identities and social positions as dynamic constructs that vary both within and between actors. Second, longitudinal data on musician mobility between cities allow one to dynamically consider nodes ranging from highly central cities to network isolates. Cities make useful nodes for testing the influence of disconnectedness since one can consider a node's influence without requiring that the node exerts agency.

I explore the impact of structurally disconnected cities through the rise of jazz standards, where jazz standards are one of the key components of jazz that ethnomusicologists and other jazz scholars use to organize the nearly infinite number of dimensions along which jazz exists (DeVeaux 1991; Berliner 1994; Block 1997). Songs or tunes that are rerecorded by

as jazz standards or—as noted in the *New Grove Dictionary of Jazz* (1994, s.v. “Standard,” p. 1155)—songs that “a professional musician may be expected to know.” While the proper musicians and styles to be associated with a jazz canon are under active debate by jazz musicians, critics, and scholars (DeVeaux 1991; Brown 2004), there is greater agreement on which songs might be included (see also Faulkner and Becker [2009] on the role of the jazz repertoire).

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many jazz musicians over time represent the music most identified as the “jazz standards,” which members of the genre’s community would recognize. Jazz standards not only are a means of conveying identity but also provide members of the jazz art world with a basis of comparison and evaluation (Faulkner and Becker 2009). For example, a performance of Strayhorn and Ellington’s “Take the ‘A’ Train” is typically considered a “jazz performance” independent of how well it is performed or what instruments it is performed on. Moreover, without any other information, whoever performs this song is likely to be considered a jazz musician by audience members (*New Grove Dictionary of Jazz* 1994, p. 1155). This role of jazz standards persists in the academy among music theorists and musicologists (Block 1997; Pond 2003). For instance, the music theorist Steven Block (1997) uses a jazz standard recording (“Bemsha Swing”) to define free jazz (a subgenre of jazz thought to be music lacking form and defying definition). Without the jazz standard, there would be too few reference points with which to evaluate free jazz.

Thus, rerecording a song or tune can provide a musician with greater legitimacy by demonstrating membership in the category of jazz.⁴ A song may also be rerecorded because it is unusual or exotic, leading some musicians to draw on the music as a means to differentiate themselves from other musicians. In my model, music associated with the first rationale (to garner legitimacy) was associated with established, central cities in the jazz community. The second rationale (differentiation) was associated with cities high in disconnectedness.

From this standpoint I explore two sets of predictions and findings. First, I follow a long line of research and argue that highly central cities at the nexus of musician networks are more likely to contribute to the canon of recorded jazz. This argument, related to the work of Burt’s (1992) theory of structural holes and the relationship between social position and “good ideas” (Burt 2004), suggests that cities at the crossroads of musician mobility are best able to facilitate the combination of conventions, styles, and so forth and disseminate them as well. This should be especially the case when there is also a high concentration of musicians within the city (Sorenson and Audia 2000; Sorenson and Stuart 2001). Moreover, highly central cities benefit from greater visibility. More musicians entering and leaving a city are going to enhance its identity as a dynamic cosmopolitan music scene (Lena and Peterson 2008). Indeed, one

⁴ The terms “song” and “tune” typically refer to an emphasis on the verbal lyrics (song) or melody (tune) of a musical piece. Given that jazz standards often have lyrics associated with them and were often sung during early jazz, I use the term “song” generally referring to either definition (see also Stanfield’s [2005] similar usage in his study of “St. Louis Blues”). That said, many rerecordings of a piece over time, even if lyrics were initially central, evolved to an emphasis on the melody or “tune.”

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would expect locations such as Chicago and New York to be central communities in the network of musician mobility that not only produce substantial contributions to the jazz community but are largely agreed on as locations where legitimacy of jazz was arbitrated.

My main emphasis, however, lies not with the role of centrality, but with a city's level of disconnectedness. In a market such as jazz where novelty is rewarded, outputs from disconnected cities are more likely to receive broader appeal. If this appeal occurs early in the rise of the genre, as is the case with my study, this appeal may also influence the canon of recorded jazz. Similarly to the way in which marginalized artists can be seen as authentic sources of iconoclastic art (Johnston and Baumann 2007), the congruence between the role identity associated with a disconnected city and a nonnormative recording that emerges from that city increases its appeal. For example, a difficult-to-categorize song in 1929 from New York faces the type of discount highlighted by Zuckerman (1999), but that same song from Sydney would be seen as appealing.

Note that centrality and disconnectedness do not operate in opposition. That is, while disconnectedness is most easily illustrated when examining isolates (fig. 1), all actors and entities within a network structure have some value of disconnectedness. For example, an actor can have a high value of centrality from local ties and a high value of disconnectedness due to a position outside of a large cohesive network. There may be social structures in which an actor's centrality strictly covaries with its disconnectedness but others in which there is little or no relationship. Conceptually, however, centrality and disconnectedness are distinct and analytically orthogonal.

A METHODOLOGICAL NOTE

One reason why theoretical development on disconnectedness is relatively frail is that many studies that examine network centrality disregard isolated actors without theoretical justification (Amburgey et al. 2008). At times this is driven by the use of centrality calculations that operate under the assumption that there is a single network component (no isolates or disconnected clusters). Indeed, the overwhelming majority of research in the small worlds tradition restricts analyses to the largest connected (or main) component within the data, forcing a theoretical concession over the role of disconnectedness. Indeed, one of the tradition's most influential scholars, M. E. J. Newman, develops centrality measures that first require eliminating isolates—as was done when applying a new centrality measure to Padgett and Ansell's (1993) Florentine marriage network and eliminating the Pucci family because they were a network isolate and thus not

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meaningful under Newman's (2005, p. 50) models.⁵ In other cases, popular software algorithms for eigenvector-based centrality (e.g., Bonacich 1987) or Burt's (1992) network constraint guide the choice to remove disconnected actors from empirical consideration instead of a theoretical motivation. In other words, we have been guilty of testing hypotheses by eliminating "inconvenient" data points, even when those data points may be theoretically relevant. For a host of social structural questions, discounting disconnected actors is theoretically inappropriate.

Disconnectedness may also be underappreciated because scholars too often specify network models of innovation by placing a linear and quadratic term of centrality to examine whether low and highly central actors are more or less likely to innovate (for more reasoned attempts, see Owen-Smith and Powell [2003], Uzzi and Spiro [2005], and Schilling and Phelps [2007]). In some cases this model specification is problematic, however, masking the effect of disconnectedness. Indeed, I will show that a quadratic specification of centrality appears to explain my results until the model is more properly specified using an indicator of disconnectedness.

THE RISE OF JAZZ: 1897–1933

Jazz scholars generally acknowledge that recorded jazz began in 1917, although jazz's roots in recordings of ragtime extend back to the turn of the century (Gioia 1997; Peretti 1998; Kenney 1999). The ragtime period is important in my study since some of the music first recorded before 1917 also entered the repertoire of jazz musicians. I use jazz discographies for the period 1897–1933.⁶ Accordingly, I am capturing the *discographical* jazz canon (Crawford and Magee 1992; *New Grove Dictionary of Jazz* 1994, p. 1155; Pond 2003, p. 17). The use of discographies is common within musicology (Kernfeld and Rye 1994, 1995), and it is from that

⁵ A reading of Brown (2002) as well as personal communication with John Padgett confirmed that the exclusion of the isolate (the Pucci family) results in the absence of one of the "new men" critical to understanding the social dynamics of the Florentine setting (Padgett and Ansell 1993). In one of the better attempts to reconcile the fact that actors within a small worlds social system may be disconnected, Schilling and Phelps (2007) address isolates as an "infinite path length *problem*" (my emphasis) and introduce a new measure to capture isolates. However, their theoretical stance is different (see also Rosenkopf and Schilling 2007), where all isolates are similar and static, and there is no attempt to separately distinguish the disconnectedness of actors more embedded in the system. In my model, disconnectedness is not a "problem." Rather it is a theoretically critical, but underdeveloped, sociological construct.

⁶ A discography is a listing of recordings organized by the name of a band or artist. It contains data such as the musicians on the recording, the location of the recording, the date, instruments played, catalogue and matrix numbers, record label, other labels that the recording was reissued under, etc. See <http://www.lordisco.com>.

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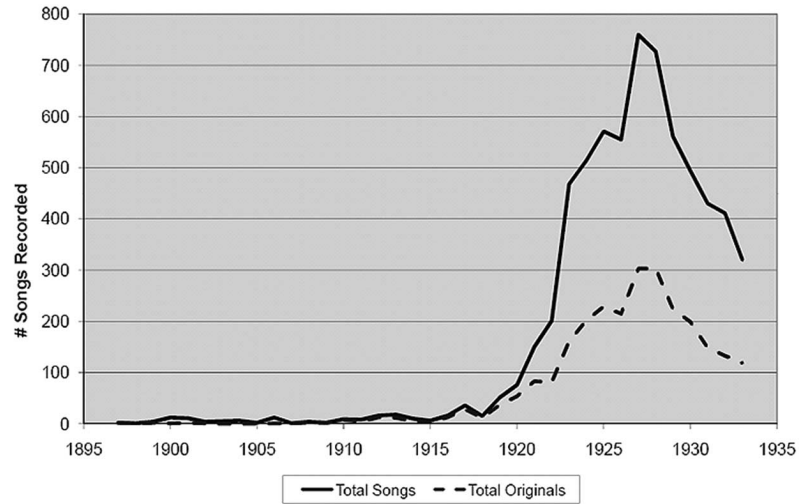


FIG. 2.—Total jazz recordings worldwide, 1897–1933. The dashed line represents the subset of recordings that were original recordings (never recorded as jazz songs before that recording).

tradition that I draw on here. The end of the observation period for the city-level data (1933) corresponds to a cultural transition in Europe that culminated in World War II (Henig 2005)—an exogenous shock that radically altered the evolution of jazz (DeVeaux 1997). The observation period for additional richer recording-level data from the Midwest is 1920–29, ending as a result of the U.S. stock market crash. This and the subsequent depression led to the failure of many record companies and a sharp decrease in recordings.

Figure 2 shows the time trend of recordings worldwide from 1897 to 1933. There is a rise of recordings beginning with the landmark recordings in 1917 that peaked in the late 1920s. The solid line shows the total number of recordings, and the dashed line indicates the subset of original recordings. After the stock market crash the number of recordings dropped substantially. The year 1933 is a historical nadir. After 1933, when my observation period ends, the 1930s swing era of jazz and its spread during World War II would fuel a second peak by the early and mid-1940s.

Musician-based mobility networks among cities and the emergence of the discographical canon.—My main empirical thrust involves estimating the appeal of a city’s music, where appeal is represented by music that is recorded (or covered) multiple times from its first recording until 2004,

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TABLE 1
EXAMPLES OF JAZZ STANDARDS: THE TOP 12 MOST
RECORDED JAZZ SONGS UP TO 2004

Song Title	Number of Times Recorded (Up to 2004)
St. Louis Blues	1,569
Body and Soul	1,530
Sweet Georgia Brown	1,212
Summertime	1,161
Take the "A" Train	1,125
Stardust	1,046
'Round Midnight	1,028
Caravan	1,024
Honeysuckle Rose	986
All the Things You Are ...	986
My Funny Valentine	901
Autumn Leaves	881

NOTE.—Data taken from the Lord discography (2005).

which increases a song's likelihood of being in the discographical canon.⁷ To provide a sense of which songs or tunes had the highest appeal by this metric, table 1 includes a list of the 12 most frequent recordings in Lord's discography. As an indicator that recordings before 1934 were critical to the discographical jazz canon, each of the songs or tunes in table 1, with the exception of "'Round Midnight," was originally recorded before 1934. Thus examining the recordings from this early period captures the music that established the foundation of the discographical jazz canon. Moreover, the appeal of these songs was driven by the key decision makers on what music to record: musicians or, more specifically, band-leaders.

THE EMPIRICAL STRATEGY

My empirics use discographical data across 67 cities worldwide (all the cities where jazz was known to be recorded) that were informed by research in music archives in the United States and Europe, as well as work drawn from musicologists and historians. My first goal with the disco-

⁷ This approach is very similar to that used by musicologists in their study of jazz's core repertory from 1900 to 1942 (Crawford and Magee 1992; Kernfeld and Rye 1994, 1995). I follow their reliance on the Brian Rust (1969) discography as it remains the most comprehensive discography on early jazz. I modified Rust's discography using Tom Lord's 2005 and 2010 discographies.

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graphical data, organized as study 1, is to statistically demonstrate disconnectedness as a determinant of long-run appeal. I will also use study 1 to establish that disconnectedness cannot be explained away by network centrality or isolation. The second study (study 2) moves from establishing the main effect for disconnectedness to the particulars of the mechanism. Here I test whether the strength of disconnectedness is driven by the reception of difficult-to-categorize music using detailed recording-level analyses. Identifying difficult-to-categorize music is necessarily contextual. Thus, to conduct this second study I focus on more detailed data from Midwest jazz recordings and qualitative evidence on four indicators of whether a jazz recording in the Midwest (or United States more generally) would be considered either difficult to categorize or easy to categorize. Using these indicators, I provide evidence that disconnectedness is advantageous only when the recordings in question are difficult to categorize. Many supplementary analyses and robustness checks were also conducted, which are presented in the appendices or referenced during the discussion of the two studies. My primary focus, however, is to test my model and predictions with study 1 and study 2.

Study 1: City Centrality and Disconnectedness as Main Effects

My arguments on a city's position in the social structure of jazz musician mobility are distilled into predictions on the role of a city's centrality and disconnectedness in influencing the appeal of musical outputs. I expect both network constructs to be positively associated with music that is appealing to the extent that musicians associated central cities with legitimated music and disconnected cities with nonnormative (or difficult-to-categorize) music that could allow a musician to be differentiated. While the mechanisms by which these two types of cities differ, each position is salient. Both highly central and highly disconnected sources were distinct sources of music, and this salience should have drawn more attention to songs and tunes that emerge from them. *All things equal, the more central a city in the musician network, the more recordings originating from that city were rerecorded (covered) by musicians over time.* Similarly, *the more disconnected a city in the musician network, the greater number of recordings originating from that city were rerecorded (covered) by musicians over time (ceteris paribus).*⁸ It is this second pre-

⁸ A note of thanks to Howard Becker for reminding me that a "cover" is a term more accurately applied to other popular genres such as rock and roll, where the musicians more strictly follow the tune and lyrics of the original recording (Becker, personal communication). It is more typical in jazz that the original recording is reinterpreted rather than strictly followed. That said, with regard to the music of the 1920s, many recordings are closer to strict replications than reinterpretations, making both terms

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diction on disconnectedness that is critical to my model, as I will test whether a city's disconnectedness is distinct from its centrality, isolation, and other local market conditions.

Study 2: Difficult-to-Categorize Recordings as the Key Mechanism

In order to empirically verify the mechanism of congruence between a recording's source and its characteristics, I use data on individual recordings to test for whether or not a recording was difficult to categorize with respect to a particular region (the U.S. Midwest) and time (1920s). My claim is that difficult-to-categorize recordings faced a discount (fewer rerecordings) when emerging from central cities but received positive appeal (greater number of rerecordings) when the original city had high disconnectedness. When recordings with difficult-to-categorize elements emerged from central cities, the recordings were seen as inconsistent with that city's identity. Central cities are more recognized as norm-preserving sources of music that legitimize the emerging genre. In contrast, disconnected cities had an identity consistent with recordings as difficult to categorize. Thus, all things equal, *recordings with difficult-to-categorize elements were rerecorded (a) more if they were originally produced when a city had high disconnectedness in the musician network and (b) less if they were originally produced when a city had high centrality in the musician network.*

I use music history with my own archival work to extract four indicators of whether a song was difficult to categorize in the Midwest during the 1920s. That is, in addition to readings on jazz during the 1920s (Austin 1925; Laubenstein 1929; Ogren 1989; Peretti 1992; Gioia 1997), I draw on my examination of archival material from the Chicago Jazz Archive, Jazz-Institut Darmstadt—the largest public jazz archive in Europe—and the Stanford Archive of Recorded Sound. This provided me access to oral histories, sheet music, and record label data, as well as advertising and marketing information. I also read musician autobiographies (e.g., Whiteman and Whiteman 1926; Bushell 1998; Gara 2002) and jazz in the public discourse from dozens of local and national newspapers (from the *New York Times* to the *Logan Republican* in Logan, Utah) and other popular and trade press publications (e.g., the *Ladies' Home Journal*, *Etude*; see also Koenig 2002), which further assisted in understanding the characteristics of jazz in the United States and Midwest during the 1920s.

The first two indicators explicitly capture whether the recording would have been difficult to categorize and the second two capture the ease of

("rerecording" and "cover") useful. In this article, I emphasize the term "rerecording" as it encompasses both exact replications and reinterpretations of original recordings.

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categorization: (1) Recordings using rare instruments were more difficult to categorize; (2) recordings by “Victorian Era” record companies were more difficult to categorize because of these firms’ contradictory actions and deceptive practices (Phillips and Kim 2009); whereas (3) recordings by groups that purposely labeled themselves to clearly signal their musical style were easy to categorize; and (4) songs that explicitly signaled sexual context were also easy to categorize. I contend that the first two indicators will make a rerecording *more* appealing when it originated from a city high in disconnectedness but *less* appealing when it came from a city with high centrality. A song with the third or fourth indicators should be *less* appealing when the song came from a city high in disconnectedness but *more* appealing when it came from a city with high centrality. In other words, songs that fit categorical rules were a mismatch with disconnectedness but consistent with centrality as musicians in my data looked to cities such as New York or Chicago to produce “legitimate” jazz, or music that is clearly classified as jazz.

None of the four indicators is “perfect,” and each could fall prey to alternative explanations. However, my goal is to demonstrate an overall pattern of results using four very different indicators that describe a recording in diverse ways (the instrumentation, the identity of the record company, the name of the group, and sexual content of the song). To the extent that these indicators show a consistent pattern, there is greater confidence that my thesis is the most plausible explanation for the summary of the findings.

First among the indicators I employ is *the use of rare, nonnormative instruments* within the context of U.S. jazz. For example, a pipe organ was considered as an unusual and generally improper instrument for jazz (Satterfield 1956, p. 86). For this study, I am less concerned with whether disconnected cities in my Midwest sample were more likely to use pipe organs in jazz, but rather jazz music using pipe organs would be more appealing if it emerged from a city high in disconnectedness. At the same time, a recording from a city high in centrality using a pipe organ was less likely to receive attention from musicians looking for music to rerecord. The pairing of a nonnormative instrument and a central city is incongruent. The use of a rare instrument may also proxy for other unique features of the recording that are unobservable to me as a researcher (such as the song’s use of timbre, color, harmonies, accents and sound effects, etc.) but observable to the consumers and community of musicians (Burt 1991; Whiteoak 1994; Baraka 1995; Nakiené 2003). Thus, I expect that the higher a city’s disconnectedness, the more appealing the music that featured rare (difficult-to-categorize) instrumentation.

Recent research on record company identity in the U.S. market for jazz reveals that these companies could be broadly identified as one of two

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types. The first type were “Jazz Era” record companies, typically founded after jazz’s first recording in 1917, and were primarily geared toward the market for jazz. As Titon (1995) and Phillips and Kim (2009) note, these record companies organized and marketed themselves as unambiguous in their meeting the consumer’s taste for jazz and other forms of popular music. A jazz recording from a label such as Paramount or Okeh would more readily be identified as authentic jazz (Phillips and Kim 2009). The second type of firms, called “Victorian Era” firms (Phillips and Owens 2004; Phillips and Kim 2009), included Columbia and Victor Records and struggled with their identities in the 1920s jazz market to the point of attempting to deceive consumers and critics with the type of music that they sought to be associated with. Chiefly, Victorian Era firms most commonly marketed themselves as producers of classical and symphonic music but in reality produced a broad spectrum of recordings (Phillips and Kim 2009). These two conditions made recordings from Victorian Era firms more difficult to categorize when compared to recordings from Jazz Era firms. Accordingly, once controlling for other characteristics of a recording, I expect that recordings from Victorian Era firms were more appealing if the city was highly disconnected. At the same time, recordings from Victorian Era firms were less appealing if the city was high in centrality.

For the third indicator, I examine the name of the recording group to see if that *group’s musical style* was clearly signaled by the name of the group. For example, the terms “orchestra” and “hot” both denoted clear styles of jazz recorded at that time. Consider two groups led by Louis Armstrong during 1928–29. The first, Louis Armstrong and His Hot Five, featured the term “hot,” which referred to a more improvisationally oriented sound, closer to the more original type of jazz rooted in ragtime that emerged from New Orleans (Peretti 1992; Gioia 1997). By contrast, the second group, Louis Armstrong and His Orchestra, used the term “orchestra” to signal a more symphonic form of jazz with larger groups and more highly arranged music (see Phillips and Kim [2009] for a discussion of the use of “orchestra” in jazz group names). U.S. audience members knew the distinction between “hot” jazz and orchestral “sweet” jazz well (Leonard 1962; Levine 1989; Peretti 1998; Lopes 2002), and many jazz groups used this public knowledge to signal their music’s style to consumers, fellow musicians, and other constituents.⁹

⁹ To compare the two sounds, a website, the Red Hot Jazz Archive, provides sound clips of music during that period. For comparison of recordings in close temporal proximity, listen to “Ain’t Misbehavin’” (<http://www.redhotjazz.com/lao.html>) recorded by the Armstrong orchestra in July of 1929 and “A Monday Date” recorded in December of 1928 by his Hot Five (<http://www.redhotjazz.com/hot5.html>).

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The goal here is not to offer an ethnomusicological analysis of the differences between these types of musical groups. Rather, I wish to draw attention to the fact that terms such as “orchestra” and “hot,” as well as other terms such as “jazz,” “hotel,” and so forth were used to signal the stylistic qualities of a group. Groups with particular name identifiers gave a strong signal of a group’s sound (48% of the groups in my sample of recordings provide a stylistic identifier in the group’s name). Groups without clear identifiers were more difficult to categorize to audience members seeking to evaluate those groups’ music.

To the extent that a group’s name facilitates categorization and classification, its association with central cities should benefit that group’s recordings (cf. Bourdieu 1996). A group self-identified as a “hot” jazz group, an “orchestra,” a “hotel,” and so forth should have released more appealing recordings when the recordings originated from central cities. At the same time, recordings by groups with clear identities do poorly when the cities were more disconnected, since disconnectedness was associated with an unclear relationship with the emerging genre.

For the fourth indicator, I used a song’s *explicit sexual reference*, capturing whether the song’s title used a popular (and, at the time, unambiguous) slang for sex: “jelly” (Wolfe 1929; Hurston 1942; Gold 1957; Maurer 1976; Allen 1984). Examples of the titles in my sample of recordings include “You’ll Never Miss Your Jelly Till Your Jelly Roller’s Gone,” “Shake That Jelly Roll,” and “Got Jelly on My Mind.” This African-American use of slang eventually reached academic and literary audiences with Zora Neale Hurston’s “Story in Harlem Slang” (1942). The meaning of the term varied within the category of sex (e.g., male or female sexual organs, intercourse) but was never ambiguous as a signal of sexual content (McCrum, MacNeil, and Cran 1992, p. 237).¹⁰

The use of sexual references was both unambiguous and a taboo. This allows a test of whether central and disconnected cities affect violations that were morally illegitimate versus those that are cognitively illegitimate (Suchman 1995). If central cities are bounded by moral imperatives, then songs with a clear sexual reference did poorly when coming from highly central cities, since sexual connotations in this post-Victorian Era remained a serious taboo (Nelson 2003; Zeitz 2006). However, I am examining whether a song was appealing, and here the question is whether it “fit” in the category of early jazz with respect to cognitive schema (cf. Griswold 1987; Zuckerman 1999). “Jelly” reduced a recording’s categorical ambiguity, increasing its appeal when produced in a location perceived as a legitimate and salient source of jazz, such as a city with high centrality.

¹⁰ It is often lost on contemporary observers that the pioneer “Jelly Roll” Morton’s name was much more likely to refer to his sexual prowess than to a pastry or dessert.

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At the same time, recordings with clear sexual references constitute a mismatch when coming from a city with high disconnectedness.

Note that this final indicator is a conservative underrepresentation of jazz's association with sexual activity. As Light (1977, p. 473), among many, has noted, jazz was often associated with "whorehouse music," and other recordings with sexual overtones would also have been clear to Americans in the 1920s. As a result I am undercounting sexual references within jazz recordings. However, my logic here has two aspects. First, the title of a recording is by far the clearest signal of a song's sexual content. Its content could have been derived without even listening to the song. Second, to the extent that I am missing music that can be categorized on the basis of its sexual content, the effect of this indicator is conservative.

QUANTITATIVE DATA AND METHODS

I test my predictions using data on jazz discographies from the Lord (2005, 2010) and Rust (1969) jazz discographies. The Lord discography is a database that provides information on 26,856 bandleaders, 149,350 recording sessions, 833,520 musician entries, and 832,791 tune entries. The 2010 edition of the discography fixes minor errors or omissions from the 2005 edition. Each of these databases is uniquely known for having very little missing data—a characteristic critical for conducting a study on disconnectedness. While my observation period is 1897–1933, the database spans from 1897 till 2004. The Lord discography builds on the Rust discography, and the Rust discography is itself a well-established, reliable, and valid source of data according to musicologists (Crawford and Magee 1992; Kernfeld and Rye 1994, 1995). Indeed, these discographies even include recordings that were made but never produced commercially for public consumption. There appears to be no other data set of jazz recordings that approaches the Lord discography's global comprehensiveness. The analysis using the Midwest data on individual recordings from 1920 to 1929 utilizes the Rust discography, with the Lord discography serving the purpose of completing any gaps in the data.¹¹

Up through 1933 jazz was recorded in 67 cities worldwide. I use the

¹¹ In their reviews of jazz discographies, musicologists Kernfeld and Rye (1994, 1995) single out the Rust discography as the most comprehensive discography for U.S. recordings before 1932, in part because it was Rust's desire to construct a broader definition than most other discographers of the time. Because of the wide agreement on the comprehensiveness of the Rust discography, there have been more recent discographies that have built on his work. The Lord discography is the best advancement on the Rust discography.

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Lord (2005, 2010) data to test for the main effect of disconnectedness and centrality using panel data on these 67 cities (study 1). The analysis examines the annual long-run appeal of all original songs from a particular city-year as a function of that city's annually updated centrality, disconnectedness, and a host of control variables. The study 2 prediction that difficult-to-categorize recordings were privileged when the city was high in disconnectedness is tested with detailed recording-level data on Midwest recordings (Rust 1969; Phillips and Kim 2009). These recording-level models can test whether the difficult-to-categorize mechanism at the center of my thesis is indeed driving the results rather than some other mechanism unobservable in the study 1 analysis.¹²

Another attractive feature of these data is that cities make valuable nodes for this form of network analysis. First, cities as nodes are temporally fixed. They do not, at least in my observation period, "fail," "die," or otherwise cease to exist. In many dynamic social networks, researchers have to grapple with the entry ("birth") and exit ("death") of nodes. That is not a concern in these analyses. Second, because the network between cities is based on musician mobility, a city can be isolated (with no musicians traveling to and from that city) but still be a source of music if the set of musicians that reside in that city recorded music locally during that time period. Moreover, the actual flow of bandleaders between cities was critical to the diffusion of conventions, preferred instruments, and so forth among musicians, making intercity mobility a critical mechanism (Danzi 1986; Bushell 1998; Miller 2005).

City-by-city mobility networks were created by annually coding the movement of bandleaders across cities as they recorded music. The network ties are weighted in that the more bandleaders moved from recording in city i to city j in that three-year window, the stronger the network tie. Tie strength reflects the volume of musicians flowing across cities, which in turn drives a city's identity. Thus, identity is driven by both the structure and volume of a city's network. The analysis for this study uses a three-year lagged window, so that the long-run appeal of a recording in year t is regressed on measures of the network created from years $t - 1$, $t - 2$, and $t - 3$ combined. As an illustration, figure 3 shows the network of mobility ties for the last year of the observation period, 1933, using mobility from 1930 to 1932.

Following the movement of bandleaders is key because bandleaders controlled the musical selections and arrangements as jazz traversed the globe. Thus, the network of bandleader mobility captures those most

¹² Before 1933 (the end of my observation period), music was recorded, released, and marketed as singles and not as albums, removing a potential confounding interdependency.

Most Central Cities: Chicago, New York, London
Highly Disconnected Cities: St. Louis, Memphis, Louisville
Isolates (most disconnected): Milan, Moscow, Oslo, Stockholm, Sydney

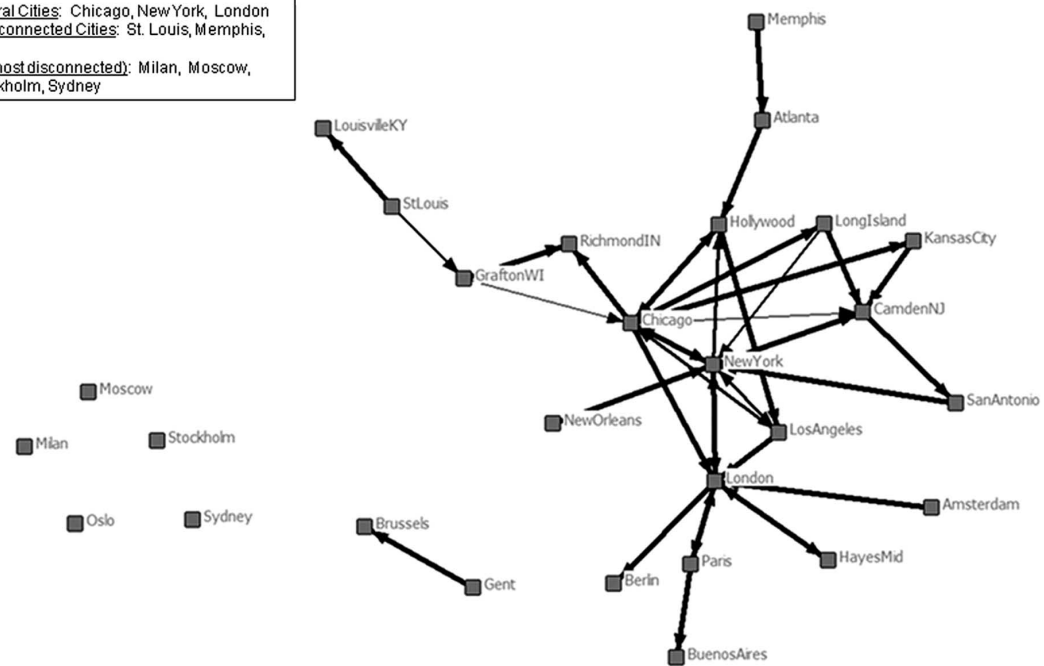


FIG. 3.—The network of cities connected by musician mobility, 1930–32 (for year 1933)

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responsible for creating and recreating jazz.¹³ The observed network between cities reflects a jazz group's investment time in the city and the group leader's decision to assemble the touring group to record tunes from its evolving repertoire.¹⁴

Thus, a network tie means that bandleaders (as carriers of musical conventions) were moving across local markets that were oriented enough toward jazz for the group to have an extended stay and invest in making recordings. The tie also reflected an evolving repertoire by the jazz group. Not only did groups practice songs that they thought audiences at their next destination would positively respond to, but they also learned new songs during their extended stays and interaction with other musicians (Danzi 1986; Bushell 1998; Rayno 2003). Moreover, while most of the network ties were created by bandleaders making single movements from one city to the next, other ties were created by the same sets of bands, spin-offs of these bands, or others who were part of the same community of musicians. Bushell (1998), a musician in Sam Wooding's band, reported that he and other members of Wooding's group often sought out other performances of native artists and fellow touring groups, during which conventions and news about the music emerging from different locations were disseminated (also see Danzi's [1986] autobiography as an American-born, Berlin-based, touring jazz musician in the 1920s).

Consistent with the historical record, Chicago, New York, and London are the most central cities in figure 3. Not only did these three cities have many network ties, but often these ties were connections to and from cities that otherwise lacked ties. Disconnectedness is less intuitively evident, except for the network isolates that are the most disconnected cities: Milan, Moscow, Oslo, Stockholm, and Sydney. In my operationalization, each network isolate in year t is given the same disconnectedness score, controlling for the fact that it is an isolate in the first place. Each of the network isolates has the same role identity in a given year, but the role identity varies across time as the overall social structure evolves annually. Thus, in my model, music from Oslo and Sydney (as two isolated cities)

¹³ While difficult to observe with available data, the touring of sidemen who worked for the bandleaders created a secondary network of musicians worldwide (Danzi 1986; Bushell 1998; Miller 2005). Through letters and the exchange of recordings, knowledge of jazz's development and reception was facilitated by these sidemen as well as the group's leader. Jazz also spread through consumers who traveled with recordings across cities. My main interest, however, is in the emergence of jazz standards, for which the network of bandleaders was primary.

¹⁴ One may question whether the spread of music occurred through the variance in distribution channels among record companies (Tschmuck 2006). My examination of these networks found little overlap with the bandleader mobility network. Moreover, my analyses in study 2 control for record label and manufacturer differences.

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is viewed similarly with respect to the cities' disconnectedness. Both would be seen as equally exotic or foreign to the worldwide community of jazz musicians but do not share a collective identity (i.e., musicians in Oslo and Sydney do not communicate with one another). In the subsequent section I will further discuss the operationalization of centrality and structural disconnectedness as independent variables in models used to test my predictions and explain why London has higher than average disconnectedness.

The recording-level analyses take advantage of the richness of the data set of U.S. Midwest recordings from 1920 to 1929. In addition to the Lord discography (2005, 2010) and Rust's jazz discography (1969), data on individual labels and firms were taken from the *Directory of American Disc Record Brands and Manufacturers, 1891–1943* (Sutton 1994). I included original recordings in the Midwest, where recorded jazz, especially improvisationally oriented jazz, emerged (Kenney 1993). This data set includes recordings by record companies with headquarters outside of the Midwest since it was common for larger record companies to own recording studios in multiple cities (Sutton 1994). The data from the Midwest encompassed Chicago, Minneapolis, St. Louis, Cincinnati, Milwaukee, Richmond (Indiana), Peoria (Illinois), Kansas City, and Cleveland. After missing data, the final data set for analysis constituted 1,752 original recordings by 355 groups.

Dependent Variable

Long-term appeal: rerecordings.—A similar dependent variable is used in each study. For study 1, in each city, for each year, I select the set of music that a city is an exclusive first-mover in recording (those simultaneously released in multiple cities are excluded) and then conduct a total citation count of how many times those recordings were rerecorded by other artists over time, from the year of its first recording through 2004. For the city-level analyses the dependent variable is the annual sum of the citation counts for all original songs from the focal city. For study 2, the dependent variable is a simple forward citation count at the individual recording level, capturing the number of times a particular recording was covered after WWII (controlling for how much it was covered before WWII). World War II represents a distinct shift in the evolution of jazz in part because of the war (DeVeaux 1991, 1997). To truly capture the long-run appeal of a recording, it is important to separate the appeal of a song before WWII from its appeal afterward. Thus, if disconnectedness is completely captured by the short-run appeal of a song (e.g., over the first decade after the recording), I will find no relationship to my dependent

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variable for long-run appeal. Qualitatively, this would constitute music that did not survive the swing era of jazz (Gioia 1997).

Models were run both as negative binomial, quantile, and ordinary least squares (OLS) regressions, producing consistent results.¹⁵ However, since the data are count data, the tables presented here are negative binomial regressions, as likelihood ratio tests (α) showed that these models were significantly better than Poisson regressions. The models using the city-level panel data are tested with random-effects models to capture between-city effects, as well as with city-level fixed effects to verify that the findings are not due to unobserved time-invariant heterogeneity at the city level such as native languages, cultural history, infrastructure, distance from other locations, and unobserved supporting industries. Moreover, subsequent analyses were replicated excluding the most central cities to ensure that they were not driving any effects. A second set of models for study 2 examines the role of difficult-to-categorize music, also using negative binomial models at the recording level. However, since there are multiple entries for some recording groups, the model specifications include robust standard errors clustering on the recording group. All models in study 2 use dummy variables to control for time trends, period effects, city of recording, and recording company.

Independent Variables

Centrality and disconnectedness.—I capture a city's centrality using Burt's effective size (1992, p. 52).¹⁶ This measure modifies centrality by the unique sources and destinations of musicians and is consistent with research capturing the boundary spanning and combinatorial innovation that can occur with entities that span social worlds (Powell, Koput, and Owen-Smith 1996; Stark 1996; Burt 2005; Obstfeld 2005). Moreover, effective size centrality discounts redundancy, which captures the overlap in conventions as well as a city's identity. Compared to simple degree centrality, higher effective size centrality should signal a more distinct identity (Burt 1982; Padgett and Ansell 1993). The greater the effective size centrality, the more widely a city is acknowledged as a legitimate source of jazz and known as a nexus of musician mobility. Thus, it matters not only that a lot of musicians come to and go from a city, which is what

¹⁵ The results of the quantile regressions for the Midwest data are included in app. B.

¹⁶ Borgatti (1997) cautions those who use Burt's effective size measure to be clear that this calculation matches Burt's theory only when ego's first-order ties are considered. Otherwise, this measure will also incorporate alters outside of ego's network. In my calculations, I am calculating each city's effective size using the first-order ties to that city—capturing Burt's theory and the correct application of the effective size measure.

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a simpler degree centrality measure would capture, but that the other cities they are affiliated with are diverse. Chicago's, New York's, and London's city-level identity is partially driven by the fact that the cities to which it is connected are diverse. Burt calculates the effective size of an actor's ego network as

$$\sum_j (1 - \sum_q p_{iq} m_{jq}), \quad q \neq i, j, \quad (1)$$

where p_{iq} is defined as the proportion of city i 's mobility ties made with city q , or

$$p_{iq} = \frac{z_{iq} + z_{qi}}{\sum_j (z_{ij} + z_{ji})}, \quad i \neq j; \quad (2)$$

m_{jq} is defined as the marginal strength of city j 's mobility tie with alter city q , or

$$m_{jq} = \frac{z_{jq} + z_{qj}}{\sum_{\max} (z_{jk} + z_{kj})}, \quad j \neq k; \quad (3)$$

and Z is the intercity mobility matrix. Effective size is calculated using UCINET version 6.189 (Borgatti, Everett, and Freeman 2002) for each city as an ego network rather than including every j in the network (Borgatti 1997).

While effective size centrality is more consistent with my emphasis on cities that lie at the nexus of mobility routes, I will also compare results with those using the simpler degree centrality to determine whether degree centrality is at least as effective. To the extent that centrality is relevant, I will verify that the effective size measure of centrality dominates the degree centrality measure.

My second key measure is disconnectedness, which captures the social structure of whom ego is *not* connected to. Whereas centrality yields an identity associated with broad legitimacy, I am arguing that disconnectedness corresponds to a salient social distance or dissimilarity (e.g., foreignness, degree of exoticism) of a focal city's role identity. I measure disconnectedness as a continuous variable, based on the asymmetric mobility matrix. It not only varies year to year for isolates depending on the overall network structure but is a property that all actors possess. Thus, it allows one to construct theories in which an actor can have high centrality and high disconnectedness, allowing even central actors to benefit from nonnormative action.

How can high centrality and disconnectedness simultaneously occur? If an actor is locally central but is outside of a large interconnected network component, the values can be high for both centrality and disconnectedness. Within my data, London has both above-average centrality

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and disconnectedness. It is central within the network of European cities but disconnected from the large, more interconnected set of U.S. cities (recall fig. 3). This operationalization is a departure from a more static dummy variable approach or a traditional core-periphery approach in which social position is more exclusively a function of centrality.

For this operationalization of disconnectedness I first took the complement of the normalized asymmetric city-by-city mobility matrix and then calculated the effective size of each city in the complement. Figure 4 builds on an earlier example in figure 1 in order to illustrate how the network complement yields a simple measure of disconnectedness. While the mobility matrix in my actual analysis is asymmetric and valued, for the purposes of the illustration I assume symmetric and binary relationships. The top two networks in figure 4 replicate the networks presented in figure 1. Recall that here we have two networks that both have isolates but whose relationship to the other three black nodes cannot be understood without a measure that indicates that the isolate in network A (isolate A) is more disconnected than the isolate in network B (isolate B). Isolate A faces a dense three-node clique, one in which in-group norms and out-group distinctions are likely to be more strictly enforced than for isolate B (cf. Coleman 1988).

By taking the complement of the two networks at the top of figure 4, we see the network of disconnectedness on the lower half of the figure. Employing effective size using Borgatti's (1997) simplification for illustrative purposes, we arrive at a measure of disconnectedness of 3.00 for isolate A and a measure of 2.67 for isolate B. I also present the disconnectedness scores for the other nodes in each network to demonstrate that the intermediary (broker) in network B has a score of 1.00 whereas the two nodes that were being bridged have disconnectedness scores of 1.50. This technique is used to calculate disconnectedness for the panel data for every city, in each three-year moving window.¹⁷

Another feature of this measure of disconnectedness is that it varies as

¹⁷ There are potentially more accurate, complex, and perhaps clever ways of calculating disconnectedness (see, e.g., Cornwell's [2005] use of the network complement and closeness centrality). My goal is to operationalize the simplest measure for capturing the theoretical construct and turn to more complex approaches only to the extent that the simpler measure logically or econometrically fails. That said, serious engagement in more nuanced measures may yield new theoretical insights. At the same time, other more common measures such as the inverse path length do not allow one to distinguish between different types of isolates. For example, not only would a measure such as the inverse path length assign a value of zero to both isolates in fig. 4, but its use is limited as it is plagued by arbitrariness in the use of k (used to construct values for unconnected nodes). Botafogo, Rivlin, and Shneiderman (1992) explain the problem more formally, but Brandes and Erlebach (2005) place this limitation in a broader literature.

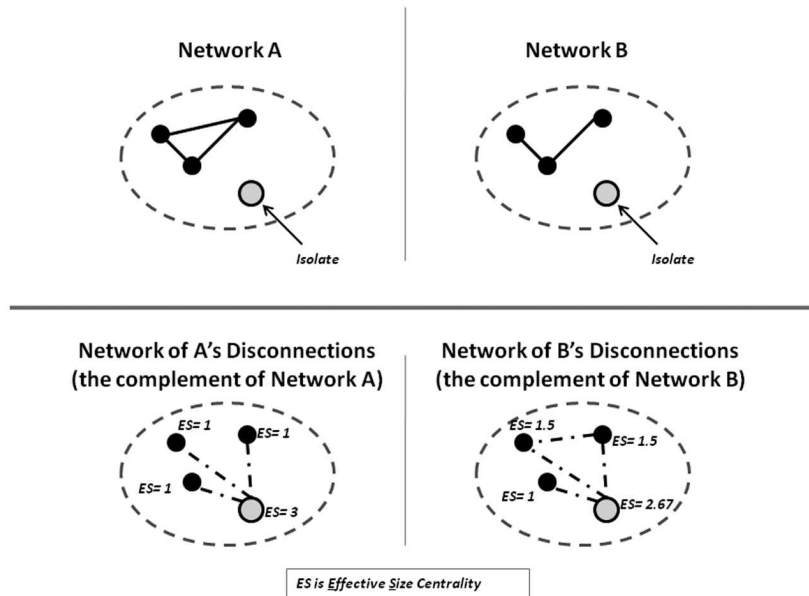


FIG. 4.—Disconnectedness using the effective size of the complement: the isolate in A has a score of 3.00 and the isolate in B has a score of 2.67.

a result of the actions not only of the focal actors but of others in the social system (cf. Padgett and Ansell 1993, p. 1300). Consider again figure 4. If the three connected members at the top of network B form a network similar to A, in which all three members are connected to one another, then the isolate's disconnectedness increases through no action of its own. This property can help capture disconnectedness in evolving systems in which the interactions of disconnected alters affect ego's position and role identity.

With this operationalization, there may be a concern of multicollinearity between centrality and disconnectedness. However, in this study a city's centrality and disconnectedness are not highly correlated in either the city-level worldwide data set ($r = .07$) or the more detailed Midwest data set ($r = -.45$). There are three factors that contribute to this relatively low correlation: (1) the network is characterized by a variety of distinct network positions that increases heterogeneity in the centrality and disconnectedness scores—tie heterogeneity tends to minimize their correlation and substantively makes unique social positions more salient; (2) the network is evolving sufficiently such that the mobility of musicians was not reaching a steady-state pattern until the end of the 1920s, which was then radically altered by the 1929 stock market crash; and (3) the effective

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size centrality measure operates on first-order ties only, such that centrality is based on immediate alters but disconnectedness is driven by alters one is not immediately connected to. Measures using the entire path length for centrality would more likely produce multicollinearity concerns.

Finally, I also created a dummy variable if a city produces jazz recordings but is an isolate in the musician mobility network. This is a control variable and a point of comparison with the measure of disconnectedness. If my operationalization of disconnectedness is merely a complicated method of measuring network isolates, my inclusion of this dummy variable should erase any findings associated with my measure. However, while network isolates are the clearest example of disconnectedness in its strongest form, my measure of disconnectedness is distinct. Not only are the capabilities of network isolates uniform across social space and time, but so is their role identity. An actor cannot both be highly central in the network and be an isolate. Moreover, every actor in my model possesses some degree of disconnectedness, whereas this is not the case for network isolation.

Figure 5 provides a scatter plot to graphically demonstrate the relationship between centrality and disconnectedness. The vertical dashed line represents the mean level of disconnectedness, and the dashed horizontal line represents the mean level of centrality. Using these dashed lines, we can simplify figure 5 into four quadrants. The upper-left quadrant represents city-years in which centrality was high and disconnectedness low. New York (in 1929) is in this quadrant. In the opposite corner quadrant are city-years in which centrality was low but disconnectedness high. Here I highlight one data point that is simultaneously occupied by two network isolates (Oslo, Norway, and Sydney, Australia) in 1931. Cities that tend to have both greater than average centrality and disconnectedness are in the upper-right quadrant. London is often in this quadrant, and its position in 1932 is identified in the figure. Recall from the intercity network diagram (fig. 3) that London's position in this quadrant is due to its centrality within Europe and disconnectedness from a relatively large network of U.S. cities. Finally, examples of actively producing cities low in both centrality and disconnectedness are Richmond, Virginia, and Brussels in 1929.

Operationalizing the indicators of difficult-to-categorize recordings (study 2).—To test my prediction about the relationship between difficult-to-categorize elements of a recording and the disconnectedness of a city, I first coded a dummy variable for whether the song featured a *rare jazz instrument*. A rare instrument is one that is used in less than 5% of the Midwest recordings during the entire observation period. The rare instruments in this analysis are bassoon (0.1% of recordings), bass saxophone (2.1% of recordings), C-melody saxophone (2.0% of recordings), flute (1.0%

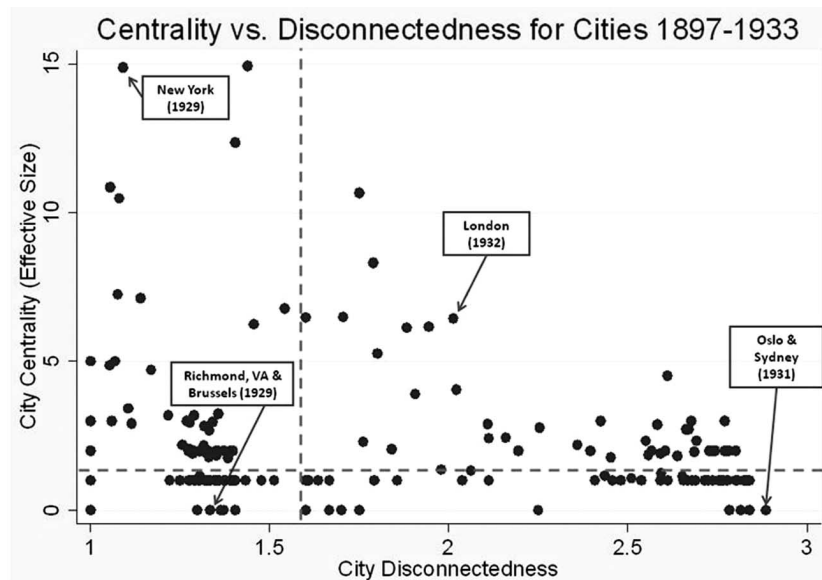


FIG. 5.—Scatter plot of effective size centrality and disconnectedness for the worldwide data set, 1897–1933; examples are selected to represent the four quadrants with the same time period.

of recordings), harmonica (0.4% of recordings), piano-accordion (3.3% of recordings), pipe organ (0.1% of recordings), steel guitar (0.4% of recordings), ukulele (0.1% of recordings), violin-cello (1.7% of recordings), vibraphone (1.0% of recordings), viola (0.1% of recordings), and washboard (4.9% of recordings). Note that these instruments may be listed as rare for multiple reasons. For example, some never became popular within jazz (bassoon), some were losing popularity by the time of the observation period (washboard), and others were yet to reach popularity (vibraphone). Specifically, I am capturing instruments that were rare in the U.S. Midwest at the time of the focal recording as a proxy of whether that recording was difficult to categorize. Any imperfections of this measure should weaken my statistical results.

As a point of calibration, I take advantage of Kraus and Harap's (1931) study of "The Musical Vocabulary of Newspapers and Magazines" in which they seek to understand the familiarity of musical terms to a wide range of the U.S. reading public (using 14 publications) by counting the number of times musical terms (including instruments) are mentioned. Kraus and Harap list each of the 214 musical terms that were mentioned more than five times. Using this as a baseline of musical instruments and terms that the average literate American would be familiar with, I ex-

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amined the frequency of instruments in my sample. The rare instruments from my Midwest sample have a median of only seven mentions in Kraus and Harap's study, whereas the remaining more common instruments in my sample have a median of 73 mentions, or more than 10 times greater familiarity to the U.S. public. To put seven mentions in perspective, instruments not in my data but that also get seven mentions in Kraus and Harap's study include the musical saw and castanet. In other words, given that the authors noted only instruments that had more than five mentions, my selection of rare instruments would be an equivalent to instruments that the 1931 U.S. public would be unfamiliar with. As such, if I am correct, recordings with rare instrumentation should have a greater appeal when they originated from a city high in disconnectedness. This positive interaction effect should not hold if a city has high centrality, however. Indeed recordings with rare instrumentation should perform worse when originating from highly central cities.

To address whether the record company was a *Victorian Era firm*, I code a dummy variable for whether the record company was founded before 1917—the year that jazz was first recorded and marketed as jazz. Any record company founded from 1917 till 1929 is coded as a *Jazz Era firm* (for extensive discussions of this distinction, see Phillips and Owens [2004] and Phillips and Kim [2009]). I use the group's name to construct a dummy variable for whether the group explicitly signals the style of music it plays. The variable *clear music style* equals one if the following terms are in the name of the group: "hot," "orchestra," "jazz," "jass," "blues," "rhythm," or "syncopation," since each conveyed the style of music the group performed during the 1920s in the United States (Ogren 1989; Peretti 1992; Kenney 1993; Gioia 1997). Finally, to capture whether recordings with explicit sexual references fare better with city centrality but suffer with disconnectedness, I code a dummy variable capturing whether a song's title contains the word "jelly" (Hurston 1942; Gold 1957; Maurer 1976; Allen 1984).

Controls for city-level analysis (study 1).—In addition to the use of dummy variables to capture time periods and trends, I coded the *number of recording sessions* to control for a city's annual production of jazz music. I also controlled for *the number of recordings per year that a city is the first to release* to capture the overall originality of the city. This allows me to separate a city's propensity to be the source of original recordings from my dependent variable, the long-run impact of those original recordings. However, since the propensity to produce original music is interesting in and of itself and relevant to my thesis, I include an analysis in appendix A on a city's propensity to be original.

I counted *the number of recordings produced worldwide* as a proxy for the time-varying size of the market. I also coded *the number of recording*

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musicians who recorded only locally and never left to record outside of the focal city. This variable helps to capture the degree to which recording musicians were oriented to the local market and thus how much musicians in other cities may have known about any local recordings or scenes (Lena and Peterson 2008). The direction of the effect is difficult to predict as it may also capture the degree to which there was an active and autonomous local market for jazz, making it unnecessary for musicians to travel. Finally, to make sure that my network variables were not just picking up cities that are entering or exiting periods of record production (a city that goes from years of not producing any jazz to a stretch of producing music, or vice versa), I include one dummy variable for *whether the city had no production in the prior three years* and another variable for *whether the city did not produce jazz three years after the focal city-year*. Thus the results will take into account any disproportionate attention that audiences (i.e., musicians) may have paid to cities that were salient or stigmatized because they either were new to the production of jazz music (suggesting a positive coefficient) or were seen as cities where jazz production ceased (suggesting a negative coefficient).

Controls for recording-level analyses (study 2).—I used dummy variables to control for the city, year, and record label of each recording. These dummy variables allow for a cleaner interpretation of the network variables. For example, industry historians (e.g., Kenney 1999; van der Tuuk 2003) have noted how the type of music produced was influenced by the uniqueness of particular companies and labels. In general, to the extent that firms have unique characteristics, this analysis controls for those differences.

I include a control for a song's *early commercial success* for two reasons. First, to the extent that there are "quality" differences between recordings, a recording's early commercial success can proxy for quality. Second, because I wish to model the long-run impact of products in a cultural market, separating out early temporary fads—a common feature of cultural markets—is necessary (Hirsch 1972; Bikhchandani, Hirshleifer, and Welch 1992; Salganik, Dodds, and Watts 2006). To capture early commercial success, I code the number of times the record company reissued the recording up until 1943 using the Rust (1969) discography (1943 is the year in which the Rust discography ends and also 10 years after my observation period). This is a supply-side indicator of a recording's success, as multiple reissues were made when consumer demand required that additional master copies of the song were required (Phillips and Kim 2009). Thus, my analysis captures sustained interest by musicians as reflected by their desires to continuously rerecord or "cover" the focal recording over the course of decades—above the recording's early commercial success.

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Similarly, since I am concerned with long-run appeal, the study 2 models control for the number of times a song or tune was rerecorded before 1943. That is, I control for the “short-run” appeal to guard against the possibility that the long-run appeal is due to the immediate interest in the recording. Like the control variable for commercial success, including short-run appeal also makes my dependent variable more conservative, as I am estimating sustained appeal over the course of decades—above the recording’s early popularity with musicians and consumers. This is also a variable that captures quality to the extent that covers reflect an assessment of quality akin to Salganik et al.’s (2006) use of popular music rankings.

I code whether the *song was recorded in the city that was the headquarters* of the record company, as record companies often had more control over such recordings and their dissemination across musicians when recording in their headquarter city. Similarly, to address the *market power and presence of the record company*, I captured (a) the annual count of advertisements each record company made in the *New York Times* using the Lexus-Nexus online search engine and (b) whether the record producer was one of the big four that had traditionally dominated the overall recording market (Victor Records, Columbia Records, Brunswick Records, and Edison Records). Both of these variables allow me to set aside concerns that the visibility of Victorian Era firms alone drove my results.

I control for the *total number of instruments* used on the recording as a measure of group size, as well as a recording’s *instrument combinatorial uniqueness* using the combination of instruments as a more general proxy for the likelihood that the recording has a particular combination of styles, conventions, and so forth. Accordingly, I constructed a recording-by-instrument matrix for the entire observation period. I used this matrix to calculate a Euclidean distance measure for each recording and to index its average distance from all other recordings. This control helps to distinguish the rare instrument effect from an effect that might come from any unique combination of instruments.

At the recording level, I code whether the recording featured *vocals*, as jazz recordings with vocals often overlapped with blues or other genres. I also coded whether the recording explicitly had a clear leader by capturing whether a *leader or arranger* is officially designated in the discography. Recordings with leaders are often marketed around a famous musician, which may attract greater attention to the song than group names that do not designate a well-known musician. I coded a variable for recordings that had *women musicians* as women performing jazz were at risk of being stigmatized (Kenney 1999). Groups were distinguished by race as well, as record companies often marketed music by the race of

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the group, which may have influenced the likelihood of a song becoming a jazz standard. Thus, I coded a dummy variable for whether the group was *white*. Occasionally, the recording group was temporarily assembled to record music in an ad hoc manner but was not an official group, lacking a true market presence independent of the song recorded. One way in which this is represented in the discography is by noting that a particular person was “accompanied by” other musicians. I created a dummy variable to capture these cases.

I also take advantage of group names to code two additional variables to address other alternative explanations. I included a variable for whether the group designated itself as a *band*. The identifier “band,” while not signaling a particular style (such as the clear music style indicator I use), is associated with groups that were more likely to have rare instruments ($P < .01$) and less likely to be associated with a Victorian Era record producer ($P < .05$). This is important because I wish to ensure that my Victorian Era and rare instrument indicators are not capturing other characteristics of the group that should have no bearing on whether the recording is difficult to categorize.

Groups were often named after geographic locations; however, the location used by the group did not necessarily correspond to the group’s actual location or origin. Rather, given the heightened role of location in evaluating these cultural products, groups often attempted to signal their legitimacy by using terms to convey their connection to the U.S. South, where jazz and blues music originated. Thus, groups would occasionally use terms such as “New Orleans,” “Dixie,” “Alabama,” and so forth, independent of whether the group was actually affiliated with the location (see Phillips and Kim 2009). To address this, I coded whether the group’s name included a *geographical reference*.

I use two controls for a group’s experience and exposure to consumers: (a) whether a group is recording for the *first time* and (b) the *total number of recordings* the group has made up to the focal recording. Capturing experience is key *when the network position of a recording is of interest* since the reaction to a recording was partially driven by the recording group’s familiarity to audiences and with the process of recording (Kennedy 1994). Also to the extent that recordings by “higher-quality” groups have greater long-run success, I capture the group’s productivity *using the number of recordings per recording date*. I also code for recordings done in the *first take* as an indicator of competence (Rust 1969; Phillips and Owens 2004). Many of the recordings within the discographies provide the number of takes required for a successful recording as part of the record’s matrix number (used for cataloguing). The format varied by firm but was often represented by either a number or a letter (e.g., A

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refers to the first take, *B* refers to the second). Recordings that were made successfully in the first take are coded 1 (0 otherwise).

Two additional competing hypotheses about groups are important to address. First, if disconnected cities are more likely to record traveling or touring groups, then an effect thought to be due to some aspect of the city's disconnectedness is confounded by the fact that it attracts musicians who themselves take their music to other cities and regions. To address this, I used a dummy variable to code whether the recording group was a *mover or stayer*. "Movers" were groups that recorded in more than one city. "Stayers" recorded in only one city and are therefore more likely to be locally oriented. The dummy variable equaled one for movers and zero for stayers. In my Midwest sample, 19.8% of the recordings were recorded by movers. Second, a city's social position may be confounded by the peer-to-peer network of musicians. That is, some songs likely diffuse because the group's musicians have past collaboration ties to many other musicians (Lopes 2002; Uzzi and Spiro 2005), increasing the likelihood that songs from the focal group will be learned and rerecorded by others. As a proxy, I calculated the average cumulative degree centrality across members of each recording group and included this variable as a control. I also separately coded *whether all of the musicians in the group are recording for the first time*.¹⁸ In either case, the more direct ties that a group has to other musicians outside of that group based on whom they previously recorded with, the more often the focal recording might be covered (presumably by those network contacts of the focal group). The key hypothesized effects should remain with these controls included.

A final control variable is entered to address a difficult-to-observe measurement error. That is, a few recordings have the same title but are not the same songs. In many cases one can easily discern the difference by listening to the music; however, not all recordings are available for audio comparison. To proxy the effect on measurement, I entered a variable for the 4.4% of the cases in which the *title has one word*, as this measurement error was most commonly associated with one-word titles (e.g., "Sugar"). Thus, to the extent that a title is overcounted, this control variable will be positive and significant. Tables 2 and 3 provide descriptive statistics for the worldwide data and Midwest data.

¹⁸ This is similar to the control variable for whether the recording group is recording for the first time but specifically captures a special case in which not only did the group record for the first time but none of the members of the group had recording experience. Most of the time, at least one of the musicians in a group had some recording experience. Thus it is not surprising that the two control variables are not too highly correlated ($r = .05$).

TABLE 2
 DESCRIPTIVE STATISTICS FOR WORLDWIDE DATA: STUDY 1

	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11
1. Long-term appeal of songs (citation count)	89.74	266.08	1	2,892	1.00										
2. City effective size centrality	1.07	2.16	0	14.93	.64	1.00									
3. City degree centrality	3.81	9.76	0	68	.65	.90	1.00								
4. City disconnectedness	1.59	.58	1	2.885	-.01	.15	.07	1.00							
5. City is isolate	.60	.49	0	1	-.26	-.67	-.49	-.29	1.00						
6. No. recording sessions (divided by 1,000)	1.09	3.70	0	44.21	.70	.77	.77	.03	-.29	1.00					
7. No. recording groups that never left city	9.96	29.64	0	213	.77	.74	.70	.00	-.32	.81	1.00				
8. Log(no. songs city was 1st-mover)	1.33	1.11	0	4.77	.61	.65	.61	-.14	-.47	.61	.72	1.00			
9. Log(songs produced worldwide)	5.48	1.57	0	6.63	.12	.27	.20	.66	-.40	.13	.14	.18	1.00		
10. Entering city	.01	.11	0	1	-.15	-.27	-.20	-.58	.41	-.14	-.15	-.08	-.71	1.00	
11. Exited city	.01	.08	0	1	-.03	-.02	-.03	.37	-.00	-.03	-.03	-.07	.27	-.28	1.00

NOTE.— $N = 331$.

TABLE 3
DESCRIPTIVE STATISTICS FOR MIDWEST DATA: STUDY 2

	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Long-term appeal	30.66	102.1	1	1,561	1.00													
2. City effective size centrality	3.4	2.27	0	7.14	-.05	1.00												
3. City structural disconnectedness	1.2	.2	1	2.25	.04	-.45	1.00											
4. City is network isolate	.16	.36	0	1	.10	-.65	.32	1.00										
5. Rare instruments used	.13	.34	0	1	.01	.09	-.07	-.08	1.00									
6. Victorian Era firm	.53	.5	0	1	-.04	-.14	.09	.09	.05	1.00								
7. Group name signals clear music style	.39	.49	0	1	.08	-.02	.01	.05	.07	-.09	1.00							
8. Sexual referwnc signaled: "jelly"	.01	.08	0	1	.01	.01	.00	-.03	.02	.01	-.03	1.00						
9. No. pre-WWII rerecordings	1.21	.7	1	11	.37	-.12	.09	.13	.02	.05	.03	-.01	1.00					
10. Early commercial success	3.06	2.2	1	24	.19	.00	.04	-.07	.04	.03	.05	.00	.08	1.00				
11. Firm-level annual count of NYT ads	6.28	11.07	0	181	-.03	.10	-.08	-.08	.07	-.10	.14	-.02	.00	.02	1.00			
12. Firm was one of largest four	.35	.48	0	1	.03	.36	-.16	-.13	.16	-.18	.13	-.01	-.03	-.04	.57	1.00		
13. Recording in record company HQ	.06	.24	0	1	.04	.10	-.12	-.03	.04	-.28	.06	-.02	-.02	.00	.09	.24	1.00	
14. Size of recording group	6.65	3.82	6.75	3.82	.07	.01	.13	.05	.23	-.05	.53	-.05	.08	-.03	.16	.25	.07	1.00
15. Instrument combo uniqueness	195.4	26.57	157.2	291	-.08	-.04	-.07	.06	.12	.05	.11	-.02	-.05	-.18	.10	.11	.08	.06
16. Group's first recording	.42	.49	0	1	.01	-.25	.26	.19	-.12	.04	-.16	.00	.04	.03	-.02	-.09	.08	-.09
17. Group records in multiple cities ("mover")	.21	.41	0	1	-.07	-.04	.11	.04	-.01	-.06	-.09	.02	-.06	-.09	.06	.05	-.12	-.07
18. Total no. recordings to date	10.15	13.22	1	87	-.03	.34	-.11	-.15	.05	.12	.10	-.01	-.05	-.08	.03	.11	-.06	.10
19. Recordings per date	3.15	2.64	.2	24	-.01	-.10	.10	.01	.18	.05	.02	-.02	.02	.01	.09	.03	.10	.19
20. Group has female members	.31	.46	0	1	-.03	-.01	-.03	-.10	-.14	.00	-.22	-.03	-.09	.02	-.08	-.15	-.13	-.32
21. Group is white	.29	.45	0	1	.12	-.24	.16	.28	.02	.09	.35	-.05	.13	-.10	.02	.00	.02	.55
22. Group has leader	.2	.4	0	1	.06	-.06	.19	.05	.05	-.11	.36	-.04	.05	-.11	.07	.18	.08	.55
23. Group has arranger	.05	.21	0	1	.00	.03	.13	.02	.10	-.05	.14	-.02	.03	-.01	.03	.09	.01	.34
24. Only assembled for recording	.01	.11	0	1	-.03	-.06	.03	.13	-.04	-.09	-.09	-.01	-.03	-.04	-.01	.01	.07	-.04
25. Group labeled as a "band"	.05	.23	0	1	.05	-.09	.05	.08	.05	-.02	-.01	-.02	.06	.12	.09	-.03	-.04	-.02
26. Group name has geographical reference	.15	.36	0	1	.00	-.02	.07	-.03	.03	.03	-.01	-.01	.01	-.02	.00	.00	-.06	.02
27. Recording has vocals	.51	.5	0	1	-.05	.17	-.19	-.19	-.16	-.02	-.18	.00	-.09	-.12	-.08	-.02	-.05	-.15
28. Average degree centrality of group's musicians	148.9	65.68	0	220	-.02	.57	-.16	-.47	.03	-.10	-.07	.03	-.11	.03	.01	.20	.00	-.03
29. All members recording for 1st time	.01	.7	0	1	.00	.00	.00	.01	-.03	-.03	-.02	-.01	-.02	.01	.01	.01	.05	-.02
30. Song recorded in 1st take	.68	.47	0	1	.03	-.17	.02	.03	-.01	.01	-.03	.03	.01	.05	-.15	-.28	-.15	-.15
31. Group name features person's name	.85	.35	0	1	-.01	-.05	.06	.04	-.07	.00	.01	.03	-.01	-.01	-.01	-.10	.03	.12
32. Song title has one word	.05	.21	0	1	.06	-.06	.12	.11	.00	.01	.04	-.02	.04	.01	-.04	-.01	-.03	.10

	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
14. Size of recording group																		
15. Instrument combo uniqueness	1.00																	
16. Group's first recording	.01	1.00																
17. Group records in multiple cities ("mover")	.09	-.14	1.00															
18. Total no. recordings to date	-.01	-.39	.04	1.00														
19. Recordings per date	.02	-.04	-.06	.12	1.00													
20. Group has female members	-.09	-.06	.10	.09	-.03	1.00												
21. Group is white	.14	.00	-.13	-.06	.02	-.37	1.00											
22. Group has leader	.22	.00	.05	.08	.04	-.18	.26	1.00										
23. Group has arranger	.15	.02	.07	.03	.03	-.02	.08	.29	1.00									
24. Only assembled for recording	-.04	.13	.04	-.06	-.01	.01	-.07	-.02	-.03	1.00								
25. Group labeled as a "band"	-.05	.12	-.03	-.08	.04	.05	-.04	-.09	.00	-.03	1.00							
26. Group name has geographical reference	-.03	.02	.06	.01	-.04	.02	-.01	-.02	.10	-.01	-.02	1.00						
27. Recording has vocals	.12	-.13	.12	.14	-.13	.39	-.16	-.13	-.01	.04	-.11	-.08	1.00					
28. Average degree centrality of group's musicians	-.02	-.19	.09	.22	-.08	.03	-.21	-.01	.01	-.08	-.08	.03	.17	1.00				
29. All members recording for 1st time	.04	.05	-.04	-.05	-.03	-.03	.01	.00	.02	.06	-.02	.04	.01	-.04	1.00			
30. Song recorded in 1st take	-.10	-.06	.02	-.04	.02	.10	-.11	-.07	-.08	.06	.05	.04	-.01	-.10	-.03	1.00		
31. Group name features person's name	.08	.02	.07	-.01	.01	.00	.12	.02	.06	.05	.01	-.22	.10	.00	.01	.01	1.00	
32. Song title has one word	.01	.06	-.03	-.02	.03	-.07	.11	.06	.03	.00	.00	.01	-.07	-.06	.02	-.04	-.01	1.00

NOTE.— $N = 1,752$.

Study 1: City-Level Results (Main Effects for City Centrality and Disconnectedness)

Before testing for the influence of a city's disconnectedness on a recording's long-run appeal, I first examined whether disconnectedness affects the propensity for a city to produce original music. My argument is that it is the reception of cultural outputs instead of the production of outputs for which disconnectedness provides an advantage. Models in appendix A show that disconnectedness is negatively associated with the production of original music. These analyses are important to consider as I test for the appeal of these recordings, for they disable a key alternative explanation: that disconnected sources are more likely to be original and novel and that this tendency explains their salience and the appeal of recordings from these cities. On the contrary, I provide evidence of a paradox: while disconnectedness is negatively associated with the production of original music, the original music that does come from disconnected cities has a disproportionately positive appeal.

With appendix A's findings in mind, table 4 presents the test of whether a city's disconnectedness positively affects the long-run appeal of its recordings using the data set of worldwide cities. Models 1–4 test effective size and degree centrality as well as one of the popular specifications for research on innovation, creativity, or performance—the quadratic specification—to capture arguments that actors high and low in centrality have more of an impact. Models 5–7 examine the role of disconnectedness while controlling for whether the city is a network isolate. Model 7 tests a random-effects specification for between-city effects. Model 8 tests whether disconnectedness is a property that all cities possess by rerunning the models without network isolates.

Models 1 and 2 present an unsurprising result. While effective size centrality captured as a linear specification is not statistically significant, the quadratic specification is significant ($P < .01$). By comparison, the degree centrality specifications in models 3 and 4 have no statistical significance, no matter the specification. Moreover, if we compare the fit of model 2 to that of model 4, we see further evidence that model 2 is better fitting ($P < .01$). Accordingly, the remaining models presented in this study utilize the effective size operationalization, as it not only is more theoretically consistent but provides a better model fit. Indeed, if some past studies were a guide for interpretation, one may conclude that there is a U-shaped relationship between centrality and impact of a city's recordings (e.g., Cancian 1967). However this result is spurious and disappears altogether when variables for disconnectedness and network isolate are introduced. Model 5 shows that a city's centrality did not affect the impact of the music that emerged from it, whereas a city's disconnectedness is

TABLE 4
 STUDY 1: RANDOM- AND FIXED-EFFECTS REGRESSION USING WORLDWIDE DATA ON A CITY'S RECORDINGS TO PREDICT LONG-TERM CITATION
 COUNT (Appeal) OF ORIGINAL SONGS PRODUCED IN THAT CITY (One-Sided Hypothesis Tests)

	Effective Size Centrality (1)	Adding Effective Size Centrality Squared (2)	Degree Centrality (3)	Adding Degree Centrality Squared (4)	Adding Disconnectedness (5)	Best Fitting (6)	City Random Effects (7)	Without Isolates (8)
City effective size centrality .....	.003 (.03)	-.18 (.07)**			-.08 (.08)	-.003 (.03)	.01 (.03)	-.01 (.04)
City effective size centrality squared .....		.013 (.004)**			.01 (.01)			
Degree centrality .....			.005 (.005)	-.016 (.014)				
Degree centrality squared .....				.0003 (.0002)				
City structural disconnectedness .....					.40 (.24)*	.48 (.23)*	.38 (.21)*	.82 (.32)**
City is network isolate .....					.32 (.18)*	.41 (.15)**	.34 (.14)**	

No. recording sessions in city (divided by 1,000) .....	.02	.01	.02	.01	.02	.03	.02	.03
	(.01)*	(.01)	(.01) ⁺	(.01)	(.01)	(.01)*	(.01)*	(.01)*
No. recording groups that never left city ....	.00	.00	.00	.001	.00	.00	-.00	-.003
	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.003)
Log(no. songs city was 1st-mover on) .....	.67	.73	.67	.68	.80	.80	.83	.95
	(.08)**	(.08)**	(.08)**	(.08)**	(.08)**	(.08)**	(.07)**	(.14)**
Log(total songs produced worldwide) .....	.47	.41	.48	.46	.36	.36	.37	-.19
	(.17)*	(.17)*	(.17)*	(.17)*	(.17)*	(.17)*	(.16)*	(.21)
Entering city: no production in prior 3 years .....	.53	.59	.50	.54	.66	.66	.47	
	(.71)	(.71)	(.71)	(.71)	(.71)	(.71)	(.68)	
Exited city: no production in 3 years post	-.15	-.47	-.11	-.25	-.71	-.69	-.54	
	(.73)	(.73)	(.73)	(.73)	(.73)	(.73)	(.72)	
City and regional fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-2.00	-1.89	-2.01	-1.98	-2.53	-2.71	-2.48	-.80
	(.48)**	(.48)**	(.48)**	(.48)**	(.54)**	(.51)**	(.49)**	(1.15)
Log likelihood (<i>df</i>)	-1,055.67	-1,050.78	-1,055.30	-1,053.93	-1,047.60	-1,048.10	-1,363.12	-461.70
	(35)	(36)	(35)	(36)	(38)	(37)	(37)	(19)
No. cases	306	306	306	306	306	306	331	125
No. cities	42	42	42	42	42	42	67	20

⁺ $P < .10$.

* $P < .05$.

** $P < .01$.

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statistically significant in every remaining model. Model 6 is the best-fitting model, with fixed effects for city and region (e.g., Western Europe, United States), as well as the inclusion of year dummy variables. It is also the model in which the effect of disconnectedness has the greatest magnitude and is most statistically significant. To provide evidence that the hypothesized effects are between-city as well as within-city effects, model 7 is a random-effects specification (no city or regional fixed effects). I also reran the models with disconnectedness, centrality, and network isolation entered in separately. In each case, support for the influence of city disconnectedness was robust.

In model 8, I test whether disconnectedness is more than mere isolation and, more generally, a property based on the degree to which ego is distinctly disconnected from other actors in the social system. A strong test of this argument is that even when isolates are removed, disconnectedness should independently support my thesis. Model 8 reruns model 6 (the fixed-effects specification that resulted in the best model fit) excluding the network isolates. If my story is just one of network isolates, then the disconnectedness measure should not drive results, and scholars have at their disposal a set of established core-periphery frameworks to explain my previous results. Moreover, the theoretical implications of my model would be less substantial. However, as model 8 reveals, the measure of disconnectedness is again positive and statistically significant. While isolates are the starkest expression of disconnectedness, the impact of disconnectedness on the emergence of the discographical jazz canon is more than just a tale of isolates.

In terms of control variables, a city's number of original recordings is significant in all models. This implies that the more original the local market, the greater the long-run success of that city's recordings. The dummy variable for network isolate is also informative, for it is positive and significant in models 5–7. This suggests that not only did recordings from isolated cities have a disproportionate appeal but that to capture that appeal, one would need to combine the effect for being a network isolate with the disconnectedness score that any network isolate would have. Finally, cities new to the jazz market had more appealing songs, perhaps because of the salience of being a new musical scene or local market.¹⁹

¹⁹ Robustness checks with Heckman models (selecting on whether a city records jazz in the first place) as well as supplemental analysis for song or city outlier effects yielded results similar to those reported in table 4.

Study 2: Recording-Level Results

Tables 5 and 6 use the U.S. Midwest recording data to test the relationship between centrality, disconnectedness, and whether a recording's characteristics are difficult to categorize. Table 5 first shows the main effects for centrality, disconnectedness, and isolation with the Midwest sample, which mirror table 4's results with the worldwide data. Disconnectedness is again significant using the data at the recording level. This is not due to differences by the record label or the characteristics of the groups captured by the controls. Moreover, the main effect for centrality is once again nonexistent. Thus, even for the subset of cities in the U.S. Midwest, where there are rich data on the recordings, labels, musicians, and groups, the results confirm that a city's disconnectedness influenced the appeal of its music among musicians over time.²⁰

With respect to control variables in table 5, several factors increase a recording's long-run appeal. As expected, early commercial success and higher early citations led to greater long-run appeal among musicians. Table 5 provides evidence that music that provided clarity through either sexual references (jelly), the group's name (clear music style), or identity of the firm (Victorian Era) was also rerecorded more often. This suggests that, on average, recordings that were easy to categorize had greater appeal. Recordings with a designated leader (indicating that the group had a "star"), were successfully recorded on the first take (reflecting recording competence), or had musicians who were either centrally connected in a collaboration network or completely new to recording were rerecorded more often. Finally, recordings that had women in the group and recordings by white groups were rerecorded more often. The supplemental analysis in appendix A (table A2) showed, however, that white groups were less likely to record original material in the first place. However, table 5 suggests that when they did, those songs were rerecorded more often.

Table 6 shows the two-way interaction terms that test the relationship between city disconnectedness and whether the recording was difficult to categorize. Models 1 and 2 provide evidence that rare instrumentation lost appeal the greater a city's centrality (model 1), but improved appeal occurred for rare instrumentation when a city's disconnectedness increased (model 2). This is the first piece of evidence toward the thesis that centrality improved the success of recordings within established categories, whereas disconnectedness improved the success of recordings that

²⁰ As was the case for the worldwide data in table 4, I also tested the quadratic specification of centrality using these Midwest data. The results replicated those in table 4.

TABLE 5
STUDY 2 RESULTS FROM MIDWEST DATA ON RECORDINGS, 1920–29

Variable	(1)
City effective size centrality	.01 (.12)
City structural disconnectedness	1.07 (.58)*
City is network isolate	1.08 (.38)**
Rare instruments used	-.03 (.18)
Victorian Era firm	-.59 (.27)*
Group's name signals clear music style	.70 (.16)**
Sexual reference signaled: "jelly"	1.10 (.49)*
Number of pre-WWII rerecordings	.74 (.10)**
Early commercial success	.21 (.03)**
Firm-level annual count of <i>NYT</i> ads	-.00 (.01)
Firm was one of largest four	-.06 (.34)
Recording in city of record company HQ	.12 (.27)
Size of recording group	-.04 (.03)
Instrument combo uniqueness (logged)	-.00 (.00)
Group's first recording	.16 (.16)
Group records in multiple cities ("mover")	-.27 (.23)
Group's total no. recordings to date	-.01 (.01)
Group's recordings per date	-.01 (.02)
Group has female members	.43 (.20)*
Group is white	1.18 (.20)**
Group has leader	.53 (.28) ⁺
Group has arranger	.16 (.39)
Group assembled only for focal recording ("accompanied by")	-1.62 (.69)*
Group labeled as a "band"	.25 (.28)
Group name features geographical reference	-.42 (.18)*
Recording has vocals	-.09 (.15)
Average degree centrality of group's musicians/1,000	3.41 (1.43)*
All members recording for 1st time	1.25 (.69) ⁺
Song recorded in 1st take	.61 (.20)**
Song title has one word	1.03 (.30)**
City dummies	Yes
Record label dummies	Yes
Year dummies	Yes
Constant	-5.42 (1.26)**
Log pseudo likelihood (<i>df</i>)	-5,621.01 (50)

NOTE.—Negative binomial regression predicting a song's long-run citation count (appeal) from date of recording till 2005; $N = 1,752$ recordings. One-sided tests for predicted effects. Robust SEs (by 355 recording groups) are in parentheses.

⁺ $P < .10$.

* $P < .05$.

** $P < .01$.

TABLE 6
 INTERACTION EFFECTS FOR STUDY 2 FROM MIDWEST DATA ON RECORDINGS, 1920–29

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
City effective size centrality .....	.05 (.11)	.03 (.12)	.03 (.12)	.01 (.12)	-.07 (.12)	-.02 (.09)	.01 (.12)	.01 (.12)
City structural disconnectedness	1.01 (.59) ⁺	.74 (.63)	1.18 (.57)*	-.29 (.89)	.78 (.59)	1.69 (.54)**	1.07 (.58) ⁺	1.08 (.58) ⁺
City is network isolate	1.13 (.37)**	1.11 (.36)**	1.02 (.37)**	1.04 (.37)**	1.03 (.37)**	1.09 (.37)**	1.08 (.38)**	1.08 (.38)**
Rare instruments used .....	.52 (.36)	-3.22 (1.44)*	.03 (.19)	.05 (.20)	.07 (.19)	.03 (.18)	-.03 (.18)	-.03 (.18)
Victorian Era firm	-.58 (.27)*	-.50 (.27) ⁺	-.22 (.34)	-2.49 (1.19)*	-.55 (.26)*	-.61 (.27)*	-.58 (.27)*	-.59 (.27)**
Group's name signals clear music style .....	.64 (.16)**	.69 (.16)**	.67 (.15)**	.70 (.15)**	-.01 (.26)	3.27 (.88)**	.70 (.16)**	.70 (.16)**
Song title has "jelly"	1.10 (.49)*	1.10 (.49)*	1.07 (.49)*	1.11 (.48)*	1.13 (.48)*	1.07 (.49)*	-.63 (2.60)	7.25 (1.43)**
City effective size centrality × rare instruments ...	-.15 (.09)*							
Disconnectedness × rare instruments		2.26 (1.20)*						

City effective size centrality × Victorian Era firm									
									-.11 (.09)
Disconnectedness × Victorian Era firm									1.61 (.96)*
City effective size centrality × group has clear style .....									.21 (.07)**
Disconnectedness × group has clear style									-2.21 (.73)**
City centrality × “jelly” .....									.42 (.67)
Disconnectedness × “jelly”									-5.28 (.95)**
Controls from main model (table 5)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Record label dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-5.63	-5.10	-5.80	-3.95	-4.92	-6.45	-5.43	-5.47	
	(1.27)**	(1.30)**	(1.29)**	(1.45)**	(1.24)**	(1.20)**	(1.26)**	(1.26)**	(1.26)**
Log pseudo likelihood (<i>df</i>)	-5,618.98	-5,618.09	-5,619.49	-5,618.84	-5,612.93	-5,615.79	-5,620.85	-5,620.41	
	(51)	(51)	(51)	(51)	(51)	(51)	(51)	(51)	

NOTE.—Negative binomial regression predicting a song’s long-run success (citation count from date of recording till 2005); $N = 1,752$ recordings. One-sided tests for predicted effects. Robust SEs (by 355 recording groups) are in parentheses.

+ $P < .10$.

* $P < .05$.

** $P < .01$.

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were more difficult to categorize.²¹ Models 3 and 4 show results for whether the record producer was the more ambiguous Victorian Era firm. The results are partially consistent with the findings for rare instrumentation. Recordings from Victorian Era firms were less appealing when associated with high centrality, but the effect was not statistically significant. In contrast, recordings from difficult-to-categorize firms were much more appealing as the city's disconnectedness increased. Model 5 strongly supports the prediction that recordings by groups that clearly signaled their musical style were more associated with appeal when the centrality of the originating city was high. Clarity of a group's music style was a mismatch with disconnectedness, however, as recordings by groups that clarified their music style were less appealing if emerging from a disconnected city (model 6). Models 7 and 8 test the prediction that recordings with clear sexual references fared well the greater the centrality of the city but fared poorly the more disconnected that city. The test for centrality is in the right direction but is not significant (model 7). The indicator for disconnectedness supports my prediction (model 8). The greater a city's disconnectedness, the less successful a song was when the word "jelly" was in its title.

Altogether, table 6 paints a particularly compelling picture, with each of the interaction effects graphically displayed in figure 6 to facilitate interpretation. Across all four indicators, difficult-to-categorize music fared better the greater the disconnectedness of the music's city. However, categorically clear recordings benefited from emerging from a city with high centrality for two of the four indicators (the rare instrument and group's musical style indicators).

Finally, I conducted several robustness checks to verify the effects in tables 5 and 6, including different operationalizations of network centrality; analysis of excluding outlier cities, groups, recordings, and time periods; additional control variables; and different forms of regressions that treat the highly skewed distribution differently (OLS, logistic regression, generalized estimating equation, Heckman two-stage, etc.). Appendix B provides the most informative robustness check using quantile regressions, which demonstrate that city disconnectedness makes the most

²¹ Another approach might ask how centrality and disconnectedness fared with recordings that used instruments intimately linked with early jazz. For robustness, I used this logic in supplemental analysis using two instruments associated with early jazz and represented in the majority of the Midwest data: the saxophone (Birchard 1925; Laubenstein 1929; Adorno 1941, p. 46; Schuller 1986; Murray 1996, pp. 11–12; Segell 2005) and standard banjo (Austin 1925; Parsonage 2003). As expected, songs with these representative instruments from cities high in disconnectedness were less appealing (statistically significant for both the saxophone and banjo) but were more appealing if the city was high in centrality (significant only for the saxophone).

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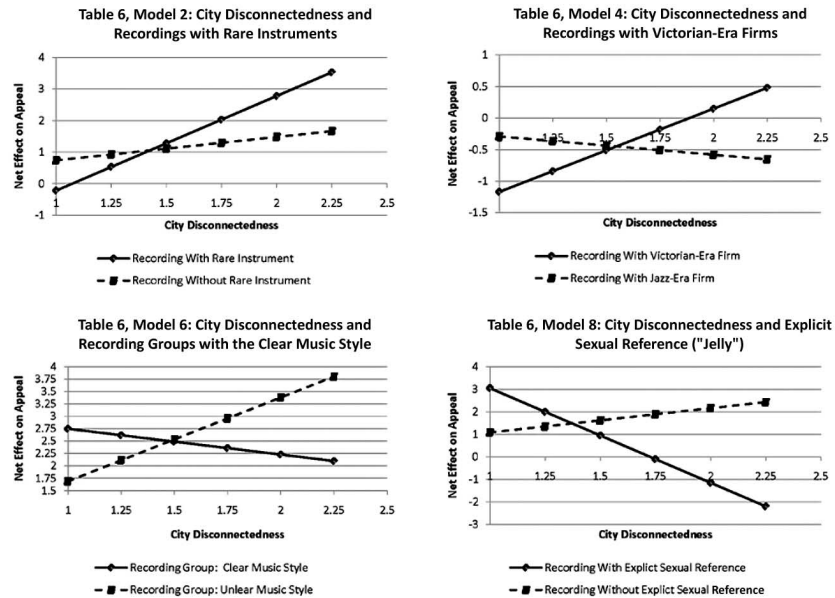


FIG. 6.—Graphs from table 6 of how city disconnectedness operates with each difficult-to-categorize indicator in affecting the net appeal of recordings.

difference for recordings that are candidates to enter the discographical canon at the 80th and 90th centiles but also verify that outliers are not driving my results.

DISCUSSION AND CONCLUSION

My primary goal has been to advance the concept of structural disconnectedness by emphasizing that the social information of nonexistent relationships, when viewed structurally, is as valuable to members of a social system as the relationships that do exist. While using a synthesis of structural theory on social relations with scholarship on the reception of cultural objects, I focus on the interpretation and imputed value associated with disconnectedness. My conceptualization is relatively intuitive yet distinct from other constructs, such as centrality or isolation. It also provides a link from a structure of production to a structure of reception and reorients attention to normative versus nonnormative actions and characteristics.

In my model, outputs from disconnected actors are appealing, not necessarily in the actions they take (see app. A) but in the interpretation of

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those actions by alters and other audience members (tables 5 and 6). The subset of difficult-to-categorize recordings from disconnected cities had positive appeal. While this decoupling of an actor's intentions and alters' (or audiences') interpretation is underappreciated in studies on organizations and markets, it is my hope that this study can fuel a call to reinvigorate the study of imputed identities within organizational and economic sociology (Katz 1972, 1975). In markets in which value is socially constructed, worth can be generated by the audience independent of the intentions of the producers.

In my model, appeal is driven by the worldwide community of musicians, specifically bandleaders. It is this community, in constant communication on the newest songs and trends (Danzi 1986; Bushell 1998; Miller 2005), that drove the appeal of some songs over others. This aspect of my model is supported by the fact that bandleaders were the primary determinants of what music a band would play and record. At the same time, it is unlikely that it was the appeal to musicians alone that drives my results. Bandleaders were responding to their audiences, which included a generation of new consumers, who were clearly noted for their attraction to novelty and culture from socially distant and dissimilar sources (Fitzgerald 1922; Jackson 2003). Moreover, record companies were certainly cognizant of evolving consumer tastes and likely played an unobservable role in finding and disseminating songs (Titon 1995; Kenney 1999). With my controls for record labels and other scholarship showing that record company attempts to champion particular songs in jazz were often met with difficulties (Gara 2002; Phillips and Owens 2004; Phillips and Kim 2009), the influence of record companies is thought to have been relatively minimal compared to that of bandleaders but still meaningful. Thus, my focus on bandleaders is best understood as drawing attention to a principal set of actors in the diffusion of jazz music and an empirically tractable group. While they often led the appeal to some songs over others, it is likely that they were also representing a consensus across the different audiences for jazz.²²

While there is strong and consistent evidence in support of my model, other alternative explanations require consideration. For example, one may have a concern about endogeneity, where there is something about the cities that improves the long-run appeal of its songs independent of (or that is also correlated with) my measure of disconnectedness. In par-

²² Students of popular culture may note that my notion of appeal is based on the attention from fellow and future musicians and is not consumer appeal (Zukin and Macguire 2004). That said, an examination of my data reveals that the top rerecorded tunes (above the 75th percentile) are also those that had high consumer appeal. In other words, the top rerecorded songs and tunes also appear to have the greatest consumer appeal.

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particular, one may question whether cities or songs may be successful only because they are somehow of higher quality (Salganik et al. 2006; Lena and Peterson 2008). If I were focusing on the production of cultural objects, this would be a much more straightforward critique in my study; but with reception, there is less concern as one needs an endogeneity-based alternative that does a better job of explaining the long-term success (from 1943 to 2004) of difficult-to-categorize songs from disconnected cities that is not already captured by the control variables for the city's centrality and whether it is an isolate; fixed effects for city, record label, and year; how much production of jazz is occurring in the city; the propensity of a city to produce original music; whether the city is new to the jazz scene; whether recording musicians from the city stay in the focal city or travel to other cities; group characteristics; the arrangement of instruments; the collaboration network of musicians based on past recordings; how many takes it took to get the song; how commercially successful the song was up to 1943 (short-term commercial success); and how many cites the song had from 1943 (short-term appeal). Moreover, difficult-to-categorize songs have lower appeal on average (see table 5), and disconnectedness is negatively related to the production of original music overall (app. A). It is only when original and difficult-to-categorize music is coupled with disconnected cities that the appeal is positive.

The conceptual model introduced here also has implications for how to link a host of studies that note or emphasize how the social distance or dissimilarity between a producer and audience affects the interpretation of cultural objects. For example, Johnston and Baumann (2007, p. 189) suggest that cultural objects can be arrayed on a continuum of *weakly to strongly exotic*. Within my model of disconnectedness, the strength of exoticism should be a function of the source's disconnectedness. The more disconnected the source, the stronger the exoticism associated with the cultural object. This should hold whether we are considering cuisine (Rao, Monin, and Durand 2003; Johnston and Baumann 2007), music (Peterson 1997; Dowd 2003; Lena 2003; Cheyne and Binder 2010), folk and tourist art (Jules-Rosette 1984; Price 1989; Fine 2004), or public art (Babon 2006).

Similarly, one can consider the implications of the concepts I have advanced for the relationship between social network structure and innovations in technological contexts. It is commonly predicted that actors who are less central are less likely to innovate, where the debate typically anchors on whether brokerage or cohesion is more positively associated with innovation (e.g., Burt 2005; Fleming, Mingo, and Chen 2007). Disconnected actors, if conceptualized at all, are thought of as producers of radical innovations. My theoretical stance suggests that sometimes a better question is not whether disconnected actors are less likely to innovate, but whether they receive disproportionate attention and appeal when their

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outputs are unique, ambiguous, or otherwise difficult to categorize. Likewise, long-standing research on the ability of incumbent firms to radically innovate (Anderson and Tushman 1990; Henderson and Clark 1990; Rosenbloom and Christensen 1994) can also ask whether and when radical innovations from highly central technological actors are more likely to be discounted by audience members. As the work of scholars like Mary Tripsas (2009) suggests, too many studies conflate the production and reception of technological innovations. My model here provides a social structural approach for capturing the reception of technological innovations, especially in emerging markets. More generally, it is my hope that this article encourages scholars to rethink the role of network structure and innovation in ways that draw attention to how the social position of producers affects how their outputs are interpreted (rather than produced) in ways not solely captured by measures of network centrality. As is the case with early jazz, network disconnectedness may provide a more powerful explanation but is currently masked by operationalizations of centrality.

A more minor but important goal of this article is to offer a solution to a methodological problem of removing isolated actors from analyses simply because the popular measures of the day do not or cannot conduct calculations of network isolates or multiple component networks. In many cases it is not that scholars do not appreciate that disconnectedness has the potential for improving our understanding of important facets of action within a social system. Rather it is our misuse of network analysis that provides an unnecessary barrier to scholars to better understand the social world. My measure of disconnectedness is informed by my empirical setting. Different measures of disconnectedness may be appropriate for other empirical settings. The point is not so much the particular operationalization of disconnectedness used here but that disconnectedness as a construct is considered in the first place.

My findings are robust and consistent using both a broad worldwide database and a rich regional database that together allow me to address multiple alternative explanations. The role of a city's disconnectedness was in its association with elements that defied categorization. When deciding on which recordings to cover, musicians did not see disconnectedness as favoring *counternormative* characterizations so much as it did those that were *nonnormative*. This is important in any social system, but in jazz it is critical as it identifies a characteristic that explains one way in which conventions and innovations were incorporated into the genre. More broadly, it was important in the emergence of jazz as a social system.

Some scope conditions.—Naturally, because of the empirical context, generalizations should be met with some caution. My context is an emerg-

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ing cultural market. While I expect that my framework applies to other markets, it is unclear whether the findings will be as powerful. With early jazz, I selected a case in which the boundaries and categories that make up jazz, as well as the network of relations associated with it, are especially fluid: it is fertile ground to explore the role of disconnectedness. In steady-state equilibrium with a presumably more stable social structure, my model may not be an improvement over existing models such as a core-periphery or center-periphery system. Many steady-state systems have a definable core of fully connected nodes that encompass a vast majority of the relevant social action and behavior. However, the emergence of jazz occurs in a period in which individual, corporate, and other collective identities were not fixed; nor was the relevant action restricted to a definable core (cf. Powell, Packalen, and Whittington 2011). There was unprecedented mobility between locales, cultural wars on several continents, and global as well as local financial shocks.

My model also carries an assumption that the community of musicians was aware of a song's (geographic) origins. This is a plausible assumption for four reasons. First, musicians actively exchanged information on the origin of appealing music, in an effort both to anticipate audience demands as they traveled and to learn new material (Danzi 1986; Bushell 1998). Second, record labels were often associated with geographical locations. In my survey of record labels from 1930, nearly every label noted the country that the record was manufactured in. As figure 7 illustrates, many records included information on the location of the recording as well, allowing future musicians to make inferences on the location of original recordings. This was especially true with smaller labels. Larger labels such as Victor records did not indicate the location of the recording on their records. At the same time, labels were often exclusively associated with particular countries, and often the name on the label alone would provide information on the location of the recording. Moreover, in some cases musicians could have also inferred the location from the language that appeared on the record label. A record label printed in Swedish, for example, would reasonably lead a musician to infer that the recording was from Stockholm.

Third, since most musicians are located in major cities, my assumption amounts to whether musicians in New York, Chicago, and London know about a song's geographical origins as 74.9% of the music community in my data comes from these three cities. Thus, given the musician routes and other geopolitical relationships, jazz emerging from Calcutta (part of British colonial rule until 1947) could have been geographically identified by musicians in London, even years after the recording. It is less likely, however, that musicians in Buenos Aires would have identified jazz from Calcutta. Thus a modification to my initial assumption is that musicians



FIG. 7.—Images of six record labels from my observation period, highlighting the information on the location of the recording as one piece of evidence that musicians could use to infer the location of a recording.

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in the most central cities were aware of a song's origins (rather than the entire worldwide community across the 67 cities). Fourth, supplemental analysis on the worldwide data set (from study 1) revealed that the effect of disconnectedness and network isolation diminished if musicians from the focal city never recorded outside of their focal city, suggesting that the musicians needed to travel so that potential adopters could be aware of music emerging from the focal city.

That said, the assumption that musicians through 2004 continue to be aware of a song's origins requires a more focused study involving the diffusion of songs and its relationship to the information that future adopters had when rerecording a song. It may be the case, for example, that difficult-to-categorize music from disconnected sources may be more appealing in the long run because of a salient diffusion trajectory of the song rather than the specifics of its origins (Nagin 2005). In other words, the song may have a special salience that becomes decoupled from the information about the song's source.²³

Future research should also be mindful that my discographical data are particularly comprehensive (Kernfeld and Rye 1994) and that one requires high-quality network data to ensure that the disconnectedness measure is not driven by missing data. Kernfeld and Rye, musicologists who provide an evaluation of discographies, list the Rust discography that I use as the most comprehensive, to the point of being potentially too inclusive in order to avoid the error of missing data. This risk of overinclusion is not a serious concern for this study, however, since its main consequence is that it increases the number of recordings that lack any long-run appeal. I also examined several additional intercity networks to ensure that the network of musicians was not a proxy for another network and potentially another mechanism. I examined networks based on opera conductor mobility (Rich 1976), vaudeville circuits (Smith 2003; Wertheim 2006), record label ownership patterns (Tschmuck 2006), and the co-occurrence of cities in periodicals and journals on art using online article searches. None of these efforts produced a network similar to the network of jazz musician mobility.

Finally, it is important to emphasize an important characteristic of my model and measure of disconnectedness: it is relatively easy to test. The mathematics of my construction of disconnectedness is intentionally rudimentary and replicable. At the same time, scholars hold at their fin-

²³ Supplemental analyses reveal that my models predict long-run appeal best up till the 1960s, when the avant-garde and free-jazz movements gained strength. After the 1960s, the models shown in this article have diminished power. This suggests that musicians were most aware of and attracted to pre-1933 recordings before the changes in jazz during the 1960s, which altered the notion of authentic jazz among musicians.

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TABLE A1
 RESULTS FROM WORLDWIDE DATA ON CITY-LEVEL OUTPUT OF RECORDINGS,
 1907–33

Variable	(1)
City centrality	-.01 (.03)
City structural disconnectedness	-.28 (.16) ⁺
City is network isolate	-.62 (.14)**
No. recording sessions in city (divided by 1,000) .....	.01 (.01)
No. recording groups that never left city .....	.007 (.002)**
Lagged dependent variable: no. songs city was 1st-mover on (previous year) .....	.002 (.005)
Log(total songs produced worldwide) .....	.50 (.28) ⁺
Entering city: no production in prior three years .....	.62 (.57)
Exited city: no production in three years post .....	.19 (.27)
City, regional, and year fixed effects	Yes
Constant	-.90 (.80)
Log likelihood (<i>df</i>)	-720.79
No. cases	310
No. cities	66

NOTE.—Negative binomial regression to predict the number of original songs in year *i*; *N* = 2,108. Two-sided significance tests (no clear predictions). Robust SEs (by 66 cities) are in parentheses.

⁺ *P* < .10.
 * *P* < .05.
 ** *P* < .01.

gertips countless data sets of network relationships, many of which meet this study’s scope conditions. Disconnectedness might apply not only to other cultural markets (e.g., Uzzi and Spiro 2005; Cattani, Ferriani, and Negro 2008; Lena and Peterson 2008) but also within technology and innovation settings using data on patents, open source communities, and alliances (e.g., Powell et al. 1996, 2005; Stuart 2000; Fleming and Waguespack 2007). At the firm level, collaboration networks exist between inventors and teams in studies meant to capture innovative activity (e.g., Reagans and Zuckerman 2001; Liu and Stuart 2010). Within the sociology of science exist collaboration and citation data among academics vying to set standards and innovate within evolving identities and professional boundaries (Collins and Restivo 1983; Moody 2004). In short, there is ample opportunity to test, refine, and extend this model of structural disconnectedness.

APPENDIX A

Disconnectedness and the Propensity to Produce Original Music

Key to my model is the fact that the value and meaning of disconnected actors are imputed independent of the actions of disconnected producers.

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TABLE A2
 RESULTS FROM MIDWEST DATA ON RECORDINGS, 1920–29

Variable	(1)
City centrality	.32 (.07)**
City structural disconnectedness	−1.31 (.57)*
City is network isolate	.80 (.33)*
Rare instruments used	−.04 (.21)
Victorian Era firm	−.04 (.38)
Group’s name signals clear music style	−.46 (.17)**
Sexual reference signaled: “jelly”	−.77 (.83)
Firm-level annual count of <i>NYT</i> ads	−.00 (.01)
Firm was one of largest four	−.08 (.29)
Size of recording group	−.05 (.03)
Group’s first recording	−.19 (.16)
Group records in multiple cities (mover)	−.11 (.23)
Total no. recordings to date	.02 (.01)*
Recordings per date	.05 (.03)
Group has female members	.13 (.21)
Group is white	−.44 (.20)*
Recording has vocals	.45 (.15)**
Main artist has accompaniment	.29 (.60)
Song recorded in 1st take	.01 (.15)
Instrument combo uniqueness	.001 (.003)
Group has leader	.50 (.21)*
Group has director	.65 (.29)*
Group has arranger	−.56 (.27)*
Group name has geographical reference	.07 (.19)
Group labeled as a “band”	−.30 (.32)
Song title has one word	−.48 (.25) ⁺
Recording in city of record company HQ	−.55 (1.29)
Average degree centrality of group’s musicians	−.001 (.001)
All members recording for 1st time	.38 (.87)
City, record label, and year dummies	Yes
Constant	6.49 (2.00)**
Log pseudo likelihood (<i>df</i>)	−862.58 (48)
Pseudo <i>R</i> ²	.10

NOTE.—Logistic regression predicting the likelihood that a song will be an original recording vs. being a rerecording; *N* = 2,111. Two-sided significance tests (no clear predictions). Robust SEs (by 385 recording groups) are in parentheses.

⁺ *P* < .10.

* *P* < .05.

** *P* < .01.

However, an alternative explanation is that, rather than the innovativeness or originality being driven by those receiving the cultural object, it is driven by the propensity of disconnected producers to be original. One compelling way of testing for this alternative is to examine, for both data sets, the likelihood that disconnected cities will produce music that is original or whether they are instead more likely to rerecord music already

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produced by others. Table A1 presents negative binomial regression results using the worldwide data set of jazz recordings. Here the dependent variable is whether the city, in a given year i , produced any original music as a function of disconnectedness with the same set of controls as reported in the main text. The estimation shows that cities high in disconnectedness and isolated cities were less likely to produce original recordings ($P = .086$ and $P = .0001$, respectively), but there is no effect for city centrality.

The second model uses the Midwest data, a narrower context, but one with richer data on each recording. Using these recording-level data, I estimate the likelihood that a recording was an original song, controlling for year, record label, and a host of additional controls highlighted in the text. These results suggest that the effect of disconnectedness is consistent with the findings in table A1. That is, the higher the disconnectedness of a city, the less likely the recording was original. In other words, high disconnectedness was associated with rerecording or covering the songs produced in other (central) cities.

Using the Midwest data (table A2), I also examined whether a difficult-to-categorize song was likely to be associated with disconnectedness using each of the four indicators (use of rare instruments, clear record label, clear music style, and sexual content). However, none of the supplementary models I ran revealed or suggested that cities high in disconnectedness were more likely to produce difficult-to-categorize music.

Overall, tables A1 and A2 suggest that disconnected cities were less likely to be sources of original music and, on average, more often replicated the music of cities high in centrality.²⁴ This highlights my argument that the impact of disconnected cities is not in what they produced so much as it is in how the music that they produced was received by other musicians. Most recordings from cities high in disconnectedness were not original. However, when they were original and when the original songs happened to be difficult to categorize, the recording had greater appeal among musicians and was more often rerecorded over time.

APPENDIX B

Quantile Regressions

Given the highly skewed distribution of the number of long-run rerecordings as my dependent variable (mean = 30.66, SD = 102.12 in table 3), it is difficult to infer whether the estimates from the negative binomial regressions operate similarly across this distribution. In other words, do

²⁴ This finding supports studies of touring musicians during this period (Danzi 1986; Miller 2005), which suggest that recorded music from disconnected cities typically sought to conform to rather than deviate from conventions.

TABLE B1
 COMPARISON OF KEY COEFFICIENTS: NEGATIVE BINOMIAL VERSUS QUANTILE
 REGRESSIONS: MIDWEST JAZZ RECORDINGS, 1920–29

VARIABLE	NEGATIVE BINOMIAL (from Table 5)	QUANTILE				
		Median = 3	60th = 6	70th = 12	80th = 30	90th = 135
City centrality .....	.01 (.12)	-.01 (.08)	.09 (.15)	-.02 (.23)	1.04 (.50)*	.50 (1.96)
City structural disconnect- edness	1.07 (.41)*	1.98 (.49)**	6.39 (1.08)**	9.63 (1.74)**	16.84 (3.91)**	62.40 (16.25)**
City is network isolate ...	1.08 (.38)**	.67 (.28)*	1.61 (.61)**	2.10 (.97)*	13.04 (2.12)**	46.76 (8.49)**
Log pseudo likelihood	-5,621.01 (50)	...	...	...	...	...
Pseudo R^2 .....	...	.04	.07	.10	.14	.22
All remaining variables from table 5?	Yes	Yes	Yes	Yes	Yes	Yes

+ $P < .10$.
 * $P < .05$.
 ** $P < .01$.

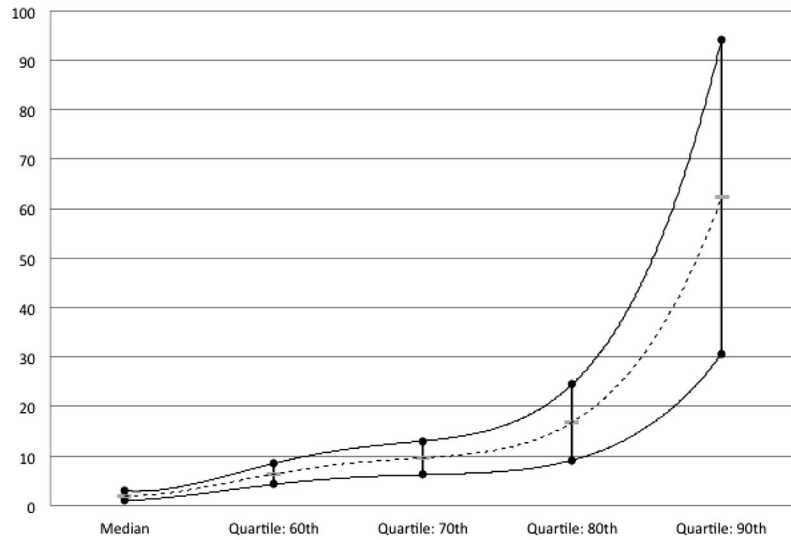


FIG. B1.—Quantile regression estimates (along dashed line) for long-run rerecordings with 95% confidence intervals (solid lines), Midwest data ($N = 1,752$).

the negative binomial results in tables 5 and 6 apply to songs that get a few “cites” as rerecordings as well as songs that get hundreds of cites as rerecordings? After all, these may inherently be different recordings in ways not captured by the control variables I used. Moreover, the negative binomial regression is prone to be disproportionately influenced by outliers (although typically not as much as with OLS regressions on these data).

Quantile regression models are one means of exploring these cases. In quantile regressions, the estimation centers on the relation between a set of predictor variables and specific percentiles (or quantiles) of the response variable (Koenker and Hallock 2001), specifying changes in the quantiles of the response. For example, a 60th percentile regression of long-run appeal (rerecordings) on city disconnectedness specifies the changes in the 60th percentile appeal (equal to six rerecordings) as a function of city disconnectedness.

The quantile regression models in table B1 (visualized in fig. B1) serve two purposes. First, they allow one to determine whether the results in tables 5 and 6 are actually driven by particular points along the distribution of the dependent variable. More generally, since the number of rerecordings (the dependent variable) is highly skewed, a comparison of quantile regression models allows one to examine the strength of the network constructs (in particular, disconnectedness) across the distribution of the dependent variable. Second, quantile regressions are not sensitive to outliers and thus serve as a means of verifying that the key variables of interest in table 5 are not solely driven by extremely successful songs.

Table B1 shows that the effect of a city’s disconnectedness is robust from the median of the dependent variable to the 90th quantile, although the effect from the 80th to the 90th quantile shows the greatest increase. According to the negative binomial regression model from table 5, a unit change in a city’s structural disconnectedness (mean = 3.4, SD = 2.27) increases the number of long-run rerecordings by 0.75. By comparison, the quantile regression results indicate that this same unit change has a larger positive impact on the higher quantiles of rerecordings. Given that a song is at the 90th quantile of long-run citations (rerecordings), a one-unit change in disconnectedness results in an average of 62.4 additional times the song was rerecorded up until 2004. This suggests that to the extent that citations capture the discographical canon, disconnectedness matters most for the songs in the upper quartile, those that are more likely to be in this canon.

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