

EMBEDDEDNESS AND THE PRODUCTION OF NOVELTY IN MUSIC: A MULTI-DIMENSIONAL PERSPECTIVE

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INTRODUCTION

What makes certain actors more likely to create new products than others? While considerable research has been conducted on the diffusion of innovation and the link between innovation and performance, both for individuals (e.g., Uzzi et al., 2013) and organizations (e.g., Ahuja, 2000), less is known about the production of novelty itself, which serves as a critical first step in the innovation process (Ruef, 2002; Seidel and Greve, 2016). Much of the research on this topic focuses on how particular sets of actors are better able to innovate than others, highlighting their individual creativity (Schumpeter, 1942; Simonton, 1984), or the dynamic capabilities of firms (Daneels, 2002; Eisenhardt and Martin, 2000). More recent scholarship, however, has emphasized the generative role of social structure for innovation, directing our attention to collaborative interactions in teams (Ruef 2010; Uzzi and Spiro, 2005), and in social networks more generally (Burt, 2004; Obstfeld, 2005). The propensity to create new things is shaped not only by individual characteristics, but by the connections between people and the relational structures in which they are embedded. Thus, we understand the production of novelty as a process that is shaped by the social structures constituting organizations, institutions, and markets (Bourdieu, 1993; White, 1981, 2002).

Our goal in this paper is to revisit the concept of “embeddedness” to evaluate how different types of relationships between actors provide distinct resources—and generate distinct opportunities—for innovation. Empirical research on social networks has largely focused its attention on how direct and indirect social ties structure economic action (Burt, 1992, 2005; Granovetter, 1985; Uzzi, 1996, 1997), but we argue here that there are other channels through which producers are consequentially connected and influenced. The act of “collaboration” need not occur through direct contact or conscious borrowing. Below, we propose a multi-dimensional framework and test the effect of four distinct types of embeddedness—social, cultural, organizational, and geographic—on the production of novelty in music.

STRUCTURAL EMBEDDEDNESS & THE PRODUCTION OF NOVELTY

As early as 1944, Polanyi argued that economic action was embedded in social structure. Granovetter (1985) and Zukin and DiMaggio (1990) developed this idea further, defining structural embeddedness as the “contextualization of economic exchange in patterns of ongoing interpersonal relations” (Zukin and DiMaggio, 1990: 18). Much of the subsequent empirical work on embeddedness has studied its effect on firm performance (e.g., Uzzi 1996, 1997), peer evaluation (e.g., Cattani, Ferriani, and Allison, 2014), and knowledge transfer (e.g., Reagans and McEvily, 2003; Wang, 2015). For example, Uzzi’s work on the garment industry in New York City finds that firms engaged in embedded, rather than arms-length, relationships are more likely to survive and thrive. This advantage only holds up to a point, however; being too embedded—measured here by the presence of strong ties between producers—can derail economic performance by insulating firms from diverse sources of information that exist outside their network of direct contacts. In their study of the film industry, Cattani and colleagues (2014) find that producer embeddedness also affects how peers evaluate each other’s work.

Note that the work cited above focuses almost exclusively on the “social” dimension of structural embeddedness, where ties between actors are defined by direct collaboration or contact. However recent work on the multiplexity of networks suggests that people are bound together by different kinds of relationships or connections (Boccaletti et al., 2014; White, Powell, and Owen-Smith 2003). Given the diversity of social life, it is not unreasonable to assume that actors are likely to have distinct positions in different kinds of networks, which in turn are likely to have independent effects on outcomes such as performance, reputation, and innovation (Heaney 2014). Padgett and Powell (2012) argue that the emergence of new organizations and markets is a function of the coevolution of multiple networks, yet our understanding of how different types of structural embeddedness affect innovation is limited.

We identify four types of network embeddedness and develop predictions for how each influences the production of novelty. To summarize: *social embeddedness* is defined by the system of direct interpersonal collaborations between actors; *cultural embeddedness* is a function of an actor’s position in a network defined by shared category membership, or cultural similarity; *organizational embeddedness* is defined by an actor’s connections with others through shared organizational affiliations; and *geographic embeddedness* is a function of an actor’s position in a network defined by physical proximity or co-location.⁴ Critically, while social embeddedness assumes some kind of direct contact or collaboration, the other types of embeddedness listed above define “relations” based on positional similarity, shared resources, or latent associations. We argue that each of these dimensions generates a unique structure that positions actors in distinct ways, independently shaping their propensity to create new and novel products through channels that are not accounted for in current research.

Our hypotheses are summarized below:

Social Embeddedness

Hypothesis 1a and 1b: Cultural producers who are more centrally connected in networks defined by direct social relations will be more (or less) likely to produce novel products.

Cultural Embeddedness

Hypothesis 2: Cultural producers who are more centrally connected in networks defined by shared category membership will be more likely to produce novel products, but only

up to a point; being too highly embedded will negatively affect their likelihood of producing novel products.

Organizational Embeddedness

Hypothesis 3: Cultural producers who are more centrally connected in networks defined by shared organizational affiliation will be more likely to produce novel products.

Geographic Embeddedness

Hypothesis 4: Cultural producers who are more centrally connected in networks defined by geographic proximity will be more likely to produce novel products.

DATA AND METHODS

To test whether and how these different dimensions of embeddedness shape the production of novelty, we use data from the global music industry, a context in which innovation is particularly important but poorly understood (Negus, 1992; Ratliff, 2016). The unique dataset used for this analysis was constructed over the course of three years, and combines information from Spotify's The Echo Nest and MusicBrainz to describe over 10,000 unique artists and 115,000 songs recorded and released between 1960 and 1995. The scope and granularity of this data allow us to (1) construct a measure of product novelty by computing the musical "distance" between songs using algorithmically-derived sonic features, and (2) calculate dynamic measures of artist embeddedness using information about band memberships and artistic collaborations (for social embeddedness), genre affiliations (for cultural embeddedness), record labels (for organizational embeddedness), and physical location (for geographic embeddedness).² We then use these embeddedness measures, along with a host of artist-level control variables, to predict the relative likelihood of an artist producing and releasing a novel song at a particular point in time.

A brief note about the model estimation technique employed in this paper: recently pioneered as a means of modeling the likelihood of discrete events over time, Relational Event Models (or "REMs") constitute a newly developed class of statistical models that allows scholars to predict social behaviors as a function of interrelated events that are in a specific temporal sequence (Butts, 2008). These models have a series of advantages over traditional panel regression methods, including: (1) they allow for fine-grained longitudinal analysis of specific "events"—here, the release of a new song—and their associated covariates; (2) they retain information about the exact sequence of events, rather than aggregating sequences across summary count measures or cross-sectional panels; (3) they include a randomly-generated risk set of "potential" events to enhance one's ability to make predictions based on observational data; and (4) their output can be interpreted as a Cox proportional hazard (e.g., conditional logistic regression) model, generating a likelihood-based understanding of predicted event outcomes (for a more complete explanation of this method, see Quintane et al., 2014 and Quintane and Carnabuci, 2016).

It is important to note that this last point requires REMs to predict dichotomous, rather than continuous, outcome variables, and thus the results reported below represent the likelihood of producing a particularly "novel" (versus "conventional") song, which we define as those

songs with a novelty score greater than 2 σ above the mean value across our dataset. Alternative specifications were estimated using a threshold of 1 σ and 3 σ above mean song novelty, and results do not significantly change.

RESULTS

Our primary interest in this paper lies in the multi-dimensional effect of embeddedness on the production of novelty. Thus, although we estimate the effects of various individual-level attributes—including artist gender, tenure, and past propensity to create novel products—we focus here on the hypothesized relationships summarized above (tables listing complete results are available upon request). Following extant research on network brokerage, closure, and innovation, we made competing predictions about how social embeddedness—which captures artistic connections through shared band membership or collaboration—might affect one’s propensity to produce novelty (cf., Burt, 2005). Surprisingly, we find no support for either prediction: artists who collaborate with others and span multiple musical groups are *not* more or less likely to produce novel songs. Given all of the extant research on social embeddedness, this finding is startling, but certainly not inexplicable. One of the reasons that we sought to test different dimensions of embeddedness was to establish whether or not they generated different outcomes. In the context of musical production, this null result suggests that the degree to which artists are directly collaborating with one other may not be as consequential for innovation as previously thought. The channels through which producers access new and different information may be defined instead by other dimensions of connectedness.

In a subsequent model, we test the effect of these other dimensions. Social embeddedness continues to be an insignificant predictor of product novelty, as does organizational embeddedness, which measures an artist’s connectedness to others through shared record labels. Although some research suggests that an affiliation with certain record labels is linked to significant gains in performance and innovation (Lopes, 1992; Peterson and Berger, 1971), the organizational connection between artists and labels is relatively weak, especially when compared to other professions. Part of the reason for this may be because the relationship between artists and labels is one of representation, rather than employment. Thus, sharing a position on a label’s roster with other artists seems to not play a significant role in how likely you are to create novel new music.

Although these initial results do not support the predictions made in H1 or H3, we find robust support for H2 and H4. Specifically, artists who are more connected to other artists based in the same city or region are much more likely to produce a novel product. For every 1 σ increase in an artist’s access to structural holes in a network defined by geographic proximity, they experience a whopping 58.5% increase in the likelihood of crafting a novel song. This is true even when controlling for US-based artists, who are more likely to be highly connected due to their disproportionate presence in our dataset. A growing stream of research on the geography of entrepreneurship has produced evidence that certain regions are more “ripe” for entrepreneurial action than others, due to the presence of like-minded actors, community support systems, and accumulated resources (Cooper and Folta, 2000; Lippmann and Aldrich, 2016; Thornton and Flynn, 2003). In the music industry, geographically-defined networks of artists generate “scenes” that cultivate identities, audiences, and aesthetic or stylistic tendencies (Crossley, 2009). Our results suggests that musicians who are physically proximate to one

another may be more likely to draw from these shared social contexts and create novel products, regardless of whether they have ever collaborated or even met.

We also find that artists who are culturally embedded are more likely to produce novel songs than their peers. An initial positive effect for this variable, which measures the degree to which artists are affiliated with the same set of genres, suggests that a 1 σ increase in cultural embeddedness results in a 37.6% increase in an artist's likelihood of releasing a novel song. When we include a quadratic term for this measure, we find a significant inverted U-shaped relationship between cultural embeddedness and the production of novelty. As predicted, moderate levels of cultural embeddedness allow artists to tap into the influence of others who are associated with some, but not all, of the same genre categories, encouraging them to differentiate themselves while also sharing common ground. This result suggests that being embedded in the same cultural context not only increases the propensity to share overlapping resources and influences; it may also induce competition for audiences between co-located producers. Perhaps competition, rather than collaboration, is the real driver of innovation in music.

CONCLUSIONS

Taken together, these findings provide evidence that cultural production—and the production of novelty in particular—is shaped by the embeddedness of cultural producers, but not in the way previous theory suggests. While existing research has focused primarily on how direct social ties impact innovation, we find that considering how actors might be connected to each other in other ways—through shared category membership, or geographic proximity—generates new insights into the organizing principles behind the production of novelty in music. It also encourages us to think more deeply about how the intersection of multiple networks and shared context influence the innovation process more generally (Padgett and Powell, 2012).

We believe that this work has important theoretical, methodological, and practical implications. First, by conceiving of structural embeddedness as a multi-dimensional phenomenon, we highlight the fact that information and influence flow not only through direct social relationships, but through other relational structures that organize social life. It may not be surprising that cultural and geographic embeddedness play such an important role in the production of new music, but exactly which dimensions of embeddedness matter most, and in what ways, may be context dependent. Future research should continue to tease apart the relationships between these dimensions and test how they operate across different domains. Second, recognizing the multiplexity of embeddedness for both individual and organizational actors may have important consequences for the way entrepreneurs and the systems that support them structure innovation. Rather than focusing solely on collaborative teams or social networks, they might identify other channels that simultaneously maximize information diversity and social cohesion. Finally, the data and methods used in this study present a host of exciting opportunities for empirical research on cultural production. Using network methods to study large quantities of data that are rich in information about cultural content and social relations will continue to generate new insights into this process.

ENDNOTES

1. It is worth pointing out that, unlike some previous treatments of cultural embeddedness (e.g., Goldberg et al., 2016; Ruef, 2002), we view each of these dimensions as a type of “structural”

embeddedness, in that they each reflect characteristics of the configuration of relations between actors. The distinction between dimensions is predicated on how the ties between actors are drawn, rather than the strength or weakness of the tie (see Moran, 2005); or the more general cultural, organizational, or geographic context in which social networks exist (see Pachucki and Breiger, 2010).

2. Detailed explanations regarding how each of these measures is constructed are included in the full version of the paper, but are excluded here due to space constraints. Please contact the author(s) for the full version of the paper.

REFERENCES AVAILABLE FROM THE AUTHORS