



DiMMI

Dictionary for Multidisciplinary Music Integration: Interaction

Trento, November 25-26, 2022

PROCEEDINGS



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Silvia Sacchetti, Nicola Conci (eds.)

INTERACTION

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Vol. 1 - Interaction

The Dictionary for Multidisciplinary Music Integration (DiMMI) is a proceedings series about the event organized by the University of Trento and the Conservatory "F. A. Bonporti" of Trento and Riva del Garda, in which musicians and representatives of the academic world are called to reflect together on a word of common interest, each from the perspective of their own discipline.

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Dictionary for Multidisciplinary Music Integration (DiMMI) 2022: Interaction

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Editorial

The Integrated Multidisciplinary Music Dictionary (DiMMI) is an annual conference in which scholars, researchers, musicians and practitioners are asked to interpret a single keyword within the perspective of their own discipline, seeking to promote the exchange of ideas at the crossroad with other research communities. After two editions, we have decided to launch a series of conference proceedings that collect the extended abstracts presented at the conference. Like the conference, this manuscript collection is multidisciplinary by its very nature.

This volume comprises the papers of all authors who contributed to the 2022 edition of the event, jointly organized by the University of Trento and the Conservatorio di Musica F.A. Bonporti of Trento.

After “dissonance” in 2020 and “rules” in 2021, the keyword chosen for the 2022 edition was “interaction”. The term interaction takes on different connotations depending on the context and the discipline in which it is adopted, in relation to the processes, languages, and technologies used. Interaction implies coordination, action, reaction, reciprocal modifications between the entities involved to guarantee communication and exchange. Interaction is present in all processes in which codes, devices, organizations, and people influence each other.

A reflection on exchanges in symbolic, physical and socioeconomic systems, which is even more relevant following the rise of novel ways of organizing and computing paradigms based on machine learning and artificial intelligence, can provide significant perspectives for interpreting the interactions that characterize our experience and our perception of music, making music and the world of sounds from unusual points of view.

Overview of the Volume

The conference has seen the participation of researchers and practitioners from different countries and academic contexts, and it has been a great opportunity for fruitful discussions that span across a variety of topics. The volume will be introduced by the contribution of three keynote speakers, Ellen Dissannayake (Univ. of Washington), Nick Crossley (Univ. of Manchester), and Almo Farina (Univ. degli Studi di Urbino). These three manuscripts set the stage for locating the conference contributions in context, ranging from the biological origin to musicality (Dissannayake), to social networks in music (Crossley), to ecology (Farina).

In particular, Dissannayake addresses how the first interaction between mothers and infants can build the foundation of a universal interactive behavior between them, commonly known as “baby talk,” which, according to the author, can be seen as a forerunner of what eventually becomes music or musicality. Crossley’s contribution addresses the issue of social interaction in music and discusses how music can be conceived as a social interaction based on rules and resources to be coordinated. He maintains that networks play a crucial role in combining resources and especially those required for making and enjoying music.

Farina’s contribution is instead focused on the analysis of the interactions across natural and human domains, investigating the central role of sound in landscape ecology. The author explores the properties of sound and the possibility of using it as a tool to activate interactions between the natural and the hybrid (created by humanity) worlds.

The second part of the volume follows the conference program, consisting of presentation sessions, poster sessions and demonstration sessions. Present-

tation sessions include the discussion of theoretical and practical frameworks to promote the idea of interaction in different domains, bringing to the attention of the audience an all round perspective on what “interaction” means, spanning across social sciences, music, philosophy, and technology. The contributions include algorithms, teaching frameworks, multimodal and multidisciplinary interaction paradigms. The poster and demonstration sessions are instead aimed at presenting practical implementations and in-progress works, such as software libraries, user studies, complementing the technical program with tangible experiences that stimulated a fruitful discussion among all the participants.

We hope the reader will enjoy the contributions included in this volume, which, in the perspective of DiMMI, aim at promoting cross-disciplinary debate, and a space where researchers, scholars, and musicians can benefit from the mutual exchange of knowledge.

The Network Dimensions of Musical Production

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Abstract

In this paper we look at the relational determinants of record production. Drawing upon data from 253 professional music teachers in Trentino, in the Italian North East, we show how record production is affected by the traits of musicians' collaboration networks.

1 Introduction and main hypotheses

Music making has long been recognized as a social process consisting of innumerable interactions between a multiplicity of actors (e.g. Becker 1982). Researchers interested in its relational and structural dimensions have increasingly relied on network analytic tools to systematically explore those mechanisms and their implications (e.g. Crossley 2020). We contribute to this line of research through the analysis of the impact of relational and structural properties over the artistic production of 253 professional music teachers active in the music schools of Trentino. We ask whether their propensity to engage in record production is related to the characteristics of the relational systems in which they are embedded, such as volume of collaborative ties, balance between ties internal and external to the local music schools' system, and organizational features (in particular, the prevailing relational patterns) of the school to which musicians are contracted. In exploring these issues we rely primarily on approaches to the embeddedness of social action in sociology and organization theory (e.g. Granovetter

1973; Burt 2005), and on our own theorizing on the mechanisms that secure the vitality of individuals and/or collectivities (Sacchetti, 2022).

In the first place, we may expect record production to be correlated with the volume of collaborative ties in which each musician is involved. One should note that collaborations are not necessarily linked to record production. People may collaborate in the context of gigs and concerts; they may jointly contribute to theater shows and other instances of performative arts, or cooperate in music education, or jointly conduct bands and ensembles. The ties forged in all these settings may provide the incentives to engage in record production, but may also work positively against them, as some may prioritize live performance over music composing or recording (Finnegan, 1998, chap. 3). Still, we may plausibly expect musicians with a high volume of collaborative ties to be more likely to find the motivations and the opportunities to also engage in record production:

H1. Musical production will be positively correlated to the overall volume of collaborative ties in which music teachers are involved.

At the same time, not only the volume of collaborators may matter, but also their location. Following Granovetter (1973), the more music teachers collaborate with musicians external to their local environment, the more one could expect them to receive new ideas, technical and emotional support, which might lead to a more active involvement in record production. The relative weight of external ties may be assessed using the E-I index (Krackhardt and Stern 1988), that measures the amount of heterophily or homophily in one's network. In our case, the reference will be

collaborative ties to musicians that are internal or external to the TMS system:

H2. *Musical production will be positively correlated to the proportion of collaborative ties that musicians have outside their local context/regular working environment.*

The structural configuration of the ties in which people are involved might also matter, as the most conducive networks to musical productivity might be those with a balanced presence of local and translocal ties. Being connected to musicians operating in the same environment through daily, face-to-face interactions provides people with a sense of belongingness in an artistic community; it may also encourage them to engage in musical production by mechanisms of mutual control and competition as well as positive influence and emulation. All this may be missing if people are only connected to people located in different, distant environments. At the same time, an exclusive reliance on local, densely-knitted ties may also facilitate complacency and self-referentiality, corresponding to a situation of lock-in (Sacchetti 2022), in which musicians lack the innovative ideas and the exposure to broader sets of experiences that might ultimately encourage production. To measure the balance of one's network we use the square of the E-I index. By squaring we are able to contrast networks with high heterophily or homophily, treated as a joint category (the index will tend to 1 in both cases) with networks with a balanced presence of heterophilic and homophilic connections (the index will tend to 0). Accordingly:

H3. *Musical production will be higher for musicians that may rely on a balanced combination of local and external ties in relation to their working environment*

We can also capture the combination of local embeddedness and external outreach by looking at musicians' position within a larger core-periphery structure. In particular, actors in a semi-peripheral position in their network of collaborations should be best located to bring innovation and engage in productive activity, as suggested by studies devoted to music (Uzzi and Spiro 2005) as well as other fields (Cattani and Ferriani 2008):

H4. *Musical production will be higher for musicians that occupy an intermediate position between core and periphery in their professional environment*

Finally, we also need to look at how the combination of relational patterns within and across specific organizational may affect organizational culture. Burt (2005) notes how organizations need to balance closure and

brokerage mechanisms to be effective. Working units need a balance between their capacity to act in a cohesive, integrated manner (reflected in a sizeable number of internal ties), and brokerage, i.e., the capacity of some of their member to fill structural holes and to have access to a broader environment. Performance is higher in groups that achieve that balance, than in groups which are imbalanced in one or the other direction; it is minimal among units that display neither brokerage nor cohesion mechanisms (Burt 2005, 139). Accordingly, we may suggest that

H5a. *Musical production will be highest for musicians who are located in schools where on the aggregate teachers hold a balanced combination of internal and external ties*

H5b. *Musical production will be lowest for musicians who are located in schools where on the aggregate teachers are poorly connected both internally, and to other musical milieus.*

2 Analysis

Given that the population is evenly split between music teachers who have and have not at least one record production to their credit, it seems appropriate to conduct two separate analyses looking for the determinants first, of presence or lack of involvement in that particular activity, and then of the amount of that involvement. Results are reported in tables 1 and 2 below.

The most consistent finding is the significance of the gender dimension across all the models we have fitted. Unfortunately, our data do not allow us to established whether women's lower involvement in record production depend primarily on glass-ceiling type of mechanisms, imbalanced division of labor within the family, persistent lack of self-confidence, or else. They point, however, at female musicians' persistent assumption of what are primarily teaching roles.

Moving to our substantive hypotheses, H1 was a purely relational one, proposing that "Musical production will be positively correlated to the overall volume of collaborative ties in which music teachers are involved." This has been constantly supported in all models barring one (model 4 in Table 1): musicians who are involved in several musical collaborations are also more likely to have

some record production to their credit, and a higher number too than more isolated ones. Taking into account that there is no strong correlation between the overall amount of collaborations, and the amount of ties people have built around record production, this is a non trivial finding. It adds one more piece of evidence to the long established view of musicking as a relational process (as summarized e.g. by Crossley 2020).

We also suggested that productivity might be related to involvement in ties that reached out of the setting in which musicians were primarily embedded, namely, the Trento music school system (H2). However, we found no support to the expectation that musical production be positively correlated to the proportion of musicians' collaborative ties outside their local context. As such, strong orientation to external ties, measured by the E-I index, did not correlate with higher productivity. The square E-I index, however, was found to matter for variations in productivity. Rather than reliance on ties outside of one's local relational context, what mattered was a balanced combination of external and local/internal (to the system rather than to specific schools) connections.

Our data support H3 that "Musical production will be higher for musicians that may rely on a balanced combination of local and external ties in relation to their working environment". Rather than on the volume of ties, this finding points at the importance of coupling embeddedness in specific settings with relations that give access to ideas and stimuli from other milieus. Musicians holding many but highly dispersed connections risk isolation from any specific context; in contrast, musicians strongly integrated in their local community but with little contact with the outer world are exposed to mechanism of self-referentiality and lock-in.

We also found the importance of a balance between internal and external ties to matter at the organizational level. In particular, musical production turned out to be highest for musicians located in schools with a balanced combination of internal and external ties (H5a). However, the opposite does not hold for schools that are weak on both grounds. Schools with that profile perform in a similar way to schools with an intermediate profile.

Finally, our data do not support H4: "Musical production will be higher for musicians that occupy an intermediate position between core and periphery in their professional environment". Whether individuals occupied a peripheral, central, or intermediate position in the web of ties that make up the local musicians' field did not seem to affect their productivity.

3 Conclusions

Summing up, our findings suggest that balance between local and external ties plays an independent, non-negligible role in accounting for individual record production. This applies not only in reference to the distribution of ties for each individual, but also at their balance within each school. This suggests that further research is needed on the organizational properties that can play an autonomous role in encouraging artistic production.

This conclusion, however, needs to be qualified. First, it applies only to organizations where teachers are involved in a high number of connections both within and outside the local scene – this is different from what we found at the individual level with the square E-I index. Second, and most important, the overall distribution of internal and external ties is a partial measure of organizational traits, inasmuch as it largely stems from the aggregation of individual properties. It needs to be supplemented with evidence on other aspects of organizational processes that might affect productivity, such as the relative weight assigned by managers to teaching v. performance, lack or presence of interest in their integration, organizational arrangements that encourage participation in the life of the school.

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		Model 1	Model 2	Model 3	Model 4	Model 5
Total collaborations	(H1)	1.11**	1.10**	1.11**	1.00	0.98
		(0.04)	(0.04)	(0.04)	(0.03)	(0.03)
Gender (0/1; 1=male)		3.01**	3.02**	2.98**	2.78**	2.81**
		(0.85)	(0.86)	(0.85)	(1.04)	(1.09)
Semi-peripheral position (0/1)	(H4)		0.89	0.89	1.45	1.54
			(0.26)	(0.25)	(0.57)	(0.62)
Low performance expected (Burt: 0/1)	(H5b)			0.67	1.41	1.36
				(0.23)	(0.70)	(0.67)
High performance expected (Burt: 0/1)	(H5a)			0.76	1.16	1.03
				(0.25)	(0.47)	(0.43)
E-I index	(H2)				1.01	1.10
					(0.25)	(0.29)
E-I index square	(H3)				0.41	0.45
					(0.25)	(0.28)
constant		0.37**	0.38**	0.48*	1.51	1.47
		(0.09)	(0.09)	(0.15)	(0.96)	(0.95)
N		253	253	253	156	143
Prob>chi2		0.00	0.00	0.00	NS	NS
Pseudo R2		0.11	0.11	0.11	0.06	0.06

Table 1. Logistic regressions on musicians with at least one production (NB: odds ratios; s.d. in brackets; model 5 excludes musicians from CDM school; ** $p < 0.01$; * $p < 0.05$)

		Model 1	Model 2	Model 3	Model 4	Model 5
Total collaborations	(H1)	0.04**	0.04**	0.03**	0.03**	0.03**
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Gender (0/1; 1=male)		0.41**	0.40**	0.38**	0.49**	0.48**
		(0.14)	(0.13)	(0.13)	(0.16)	(0.18)
Semi-peripheral position (0/1)	(H4)		-0.06	0.03	0.09	0.10
			(0.11)	(0.17)	(0.12)	(0.14)
Low performance expected (Burt: 0/1)	(H5b)			0.03	-0.00	0.02
				(0.17)	(0.19)	(0.19)
High performance expected (Burt: 0/1)	(H5a)			0.61**	0.59**	0.50**
				(0.13)	(0.14)	(0.15)
E-I index	(H2)				-0.02	-0.07
					(0.10)	(0.11)
E-I index square	(H3)				-0.34*	-0.46*
					(0.17)	(0.19)
constant		0.52**	0.54**	0.28	0.44*	0.56*
		(0.13)	(0.14)	(0.16)	(0.22)	(0.24)
N		126	126	126	105	94
Prob>chi2		0.00	0.00	0.00	0.00	0.00
Pseudo R2		0.11	0.11	0.15	0.18	0.11

Table 2. Poisson regressions on number of record productions (NB: s.d. in brackets; model 5 excludes musicians from CDM school; ** $p < 0.01$; * $p < 0.05$)

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