CENTER FOR CREATIVE COMMUNITY DEVELOPMENT

Network Analysis and the Social Impact of Cultural Arts Organizations

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Introduction

Cultural arts organizations are part of the fabric of their communities. They offer community programming. They provide a space for community interaction. They work with other organizations for community betterment. A challenge facing them, however, is to empirically make the case for the important roles they play in creating and sustaining community viability. This paper is an initial step in using network analysis to measure and communicate that role.

Data Collected

The type and amount of data required for mapping a cultural arts organization's *primary network* are relatively modest. Conceptually, it involves gathering information on its staff, board members, and volunteers/committee members, and gathering information on additional organizations they participate in. By 'participate in', we mean organizations where they volunteer, sit on committees, or are on the board. Taking the case of MASS MoCA, we have information on 76 staff members, 28 board members, and 38 volunteers.

In order to map the *community network*, substantially more data were needed. Requests were made of many organizations for lists of their staff, board members, committee members, and volunteers. These organizations include: cultural arts organizations including museums and community arts programs; town and city officials; police and fire departments; schools and colleges; healthcare organizations; social service and charity organizations; religious organizations; professional offices; and for-profit employers. Some of these data currently are more complete than others. Thus, in some sense, we have more confidence in the links shown on the maps than in the current absence of some links. We continue to collect data in the community.

Presently, we have some amount of data on 4233 individuals who participate in the North Adams / Williamstown community. We have some amount of data from 60 organizations in the community. The individuals are employees, board members, committee members, and volunteers at these organizations. These individuals provide the linkages between the different organizations in the community.

Of the 60 organizations, 49 are linked to at least one other organization by virtue of an individual who participates in both. The 11 organizations that are not linked to any other organization are called *isolates* and are not included in the following analyses.[1] The 49 interconnected organizations make up the community network.

The Importance of Linkages for Community Vitality

In what follows, we will be looking at the linkages among organizations in the community. Why are these linkages important? The lines in our community maps represent individuals who are active in the community, participating in a wide variety of organizations. Through these multiple

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[1] Isolates can be included in a network analysis. Their inclusion here, however, causes the network map to become even more compact in the center so that the isolates can be shown on the far extremes of the map. This adds almost no information and makes the map even more difficult to read.

memberships, the community is able to identify issues of broad concern, and to more quickly and effectively identify resources that can be brought to bear on these concerns. When we examine MASS MoCA's primary network, we provide specific examples of this process.

When Sprague Electric left North Adams in 1985, large components of the existing network in the community fell apart. Many Sprague managers lived in Williamstown, and were a resource for linking the two communities together. This important link was broken, resulting for a time in an almost visible barrier between the two towns. Hundreds of families moved out of North Adams in search of jobs elsewhere, severing important ties within North Adams. The effects were not just economic, but also social.

It is difficult today to convey how distant the two towns became during this period. In the mid- to late-1980s, the unemployment rate in North Adams ran from 25 to 30 percent, the highest in Massachusetts. North Adams had been lambasted as the city with the most teenage pregnancies per capita in the nation and the highest reported rates of child sexual abuse and physical abuse of children in the state. Its high school dropout rates were more than five times the state average.[2]

The creation of MASS MoCA at the Sprague site resulted in cautious optimism in North Adams. Many individuals made serious efforts along different fronts to reweave the community's social fabric. We will see that the staff, board, and volunteers at MASS MoCA play an important role in that continuing effort.

The strength of a network analysis of the community, rather than just an organization, is that it highlights the interconnectedness of organizations, and the collaboration of the community as a whole. The results presented here enable us to visualize both the concrete relationships of MASS MoCA, and the general relationships among all organizations in the community. Both are vital to measuring and understanding the role of MASS MoCA in North Adams' regeneration.

Measuring the Social Role of the Cultural Arts in a Community
At the heart of this paper is the attempt to address empirically some questions that have been raised about MASS MoCA's social impact on North Adams, in particular, and cultural arts organizations' social impact in their communities in general. The types of questions that have been raised about cultural arts organizations include:

- Does MASS MoCA (and cultural arts organizations in general) have ties in the community that go beyond ties to other cultural arts organizations?
- In what ways is MASS MoCA actively involved in the social improvement of the community, i.e. beyond being an engine for economic regeneration and beyond programming offerings (and, more generally, how can this be a model for other cultural arts organizations)?
- How can MASS MoCA empirically communicate its social involvement and commitment to the community in such a way that the public, the city government, its own

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[2] "Not a pretty picture; City hopes museum proposal can spark dismal economy." The Boston Globe. March 2, 1992. See our paper on the history of MASS MoCA and North Adams. Kay Oehler, Stephen C. Sheppard, and Blair Benjamin. 2006. "Mill town, factory town, cultural economic engine: North Adams in context." C^{3}D Report NA1.2006.

board of trustees, and potential funders can understand and value that commitment (and that other cultural arts organizations can use as a model for their own efforts)?

In order to address these questions, we developed a dataset consisting of individuals in the community and the organizations to which they belong. The data were collected from a wide variety of organizations, and are part of an ongoing effort.[3] We used the network programs Ucinet, Pajek, and NetMiner to analyze the data and map the community network.[4]

In the maps that follow, each point or dot is called a node and represents an organization in the community. A link between two organizations is represented by a line connecting them in the map. What we mean when we say there is a link is that there is at least one individual who participates in both organizations. That individual links the two organizations.[5] In some cases, multiple individuals link two organizations. Multiple links are represented throughout this paper by the physical closeness of organizations in the figure, not by multiple lines.

An Organization's Position in the Network: Degree Centrality
We view the community network as a set of collaborative relationships. These relationships are formed between organizations by individuals participating in them. *We view these links as two-way and mutually beneficial.* One of the goals of network analysis is to describe in a meaningful way the position of organizations in the network.

The community network of North Adams/Williamstown is too large and complex to map in a way that is visually meaningful.[6] Due to the large number of organizations represented, it is difficult to see each organization clearly or to follow each link between organizations.[7] It is possible, however, to use statistical measures to describe and compare networks, even very large and complex networks. A centrality index is one such measure. In this section we focus on *degree centrality*.

The ***degree*** of an organization is the number of links it participates in. That is, it is the number of lines coming from it (or going to it) in the network map. Our dataset consists of 49 organizations. Since an organization does not link to itself, the maximum degree is 48.

Degree centrality is the proportion of all possible links in the network that an organization participates in. This measure has a range between 0 (no ties) and 1 (tied to every other organization). The larger this number, the more linked the organization is within the community, and the more visible it is (Wasserman and Faust 1994). *Degree centrality* of an organization is its degree divided by the maximum possible degree (in our case 48).

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[3] While the focus of this paper is on not-for-profit organizations, we are collecting data from all organizations in the community, including small firms, lawyers, financial institutions and others.
[4] For more information on these programs, go to http://www.analytictech.com and http://www.netminer.com .
[5] Network analysis can be applied in any case where there are actors and links connecting those actors. Network analysis has been used in a wide variety of settings, including the study of terrorism, neural networks, and economically disadvantaged women seeking family resources.
[6] In this paper we limit the community to North Adams and Williamstown. MASS MoCA and other organizations have additional links within Berkshire County, in New York City, in Boston, and in other locations throughout the U.S.
[7] Later in this paper we map MASS MoCA's primary network as well as show subset networks within the larger community network.

As Wasserman and Faust state (1994:173ff):[8]

> Prominent actors are those that are extensively involved in relationships with other actors. This involvement makes them more visible to the others. We are not particularly concerned with whether this prominence is due to the receiving (being the recipient) or the transmission (being the source) of many ties – what is important here is that the actor is simply *involved*.[9]

Each tie in a network represents an individual who participates in both organizations. This participation allows for a flow of information between the organizations.[10] The measure of *degree centrality* was developed so that those organizations that are the most active participants in the community will be the most central in the network. *Table 1* presents the degree centrality of the forty-nine organizations in the community network.

Table 1
Degree Centrality of Community Organizations

Organization	Degree		Organization	Degree
N Berk Community Coalition	0.688		North Adams School Committee	0.125
MA College of Liberal Arts	0.646		Village Ambulance Williamstown	0.125
Williams College	0.542		Freedman DeRosa Rondeau Law	0.104
SteepleCats baseball	0.438		Hoosic River Watershed Assoc	0.104
Neighborhood Expos	0.396		North Adams Police Dept	0.104
Town of Williamstown	0.375		Pine Cobble School	0.104
MASS MoCA	0.354		Williamstown Community Chest	0.104
City of North Adams	0.354		Community Service Learning	0.083
Images Cinema	0.333		Donovan & O'Connor Law	0.083
N Berkshire United Way	0.312		Brayton Elementary School	0.083
N Berkshire Creative Arts	0.292		Village Ventures	0.083
Williamstown Rural Lands Foundation	0.292		Neighborhood Leaders	0.062
Williamstown Theatre Festival	0.271		Williamstown Elementary School	0.062
Contemporary Artists Center	0.188		Wild Oats Community Market	0.062
McCann Vocational High School	0.188		Williamstown Film Festival	0.062
Drury High School	0.188		Brig Brothers Big Sisters N Berk	0.042
The Clark art museum	0.167		Buxton School	0.042
Inkberry literary arts center	0.167		Sherwood Guernsey Law	0.042
North Adams Public Library	0.167		North Adams Fire Dept	0.042
Berk Family and Individual Resources	0.146		Overland	0.042
Mt Greylock Regional High School	0.146		WilliNet community television	0.042
Williamstown Public Library	0.146		Williamstown Police Dept	0.042
Williamstown Youth Center	0.146		Berk Arts&Tech Charter School	0.021
C3D research center	0.146		Orthopedic Assoc of N Berk	0.021
			Robert Ware Law	0.021

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[8] Stanley Wasserman and Katherine Faust. 1994 (2006). Social Network Analysis: Methods and Applications. New York: Cambridge University Press. See also: Alain Degenne and Michel Forse. 1994 (2004). Introducing Social Networks. Thousand Oaks, CA: SAGE Publications.

[9] The term actor is a general term. In our paper community organizations are the actors from a network perspective.

[10] All of the links in the social network have the potential for an exchange of information between the organizations, although many are inactive at any give time. The linkages exist, but are fully activated only during times of crisis and opportunity.

We see in *Table 1* that the Northern Berkshire Community Coalition has the highest degree centrality score, with 0.688. Thus, it has links with about 2/3 of the organizations. Going back to the original data set, we confirm that 33 of the 48 other organizations have links with the Northern Berkshire Community Coalition. To quote Wasserman and Faust (1994:179), "An actor with a large degree [centrality] is in direct contact … to many other actors. This actor should then begin to be recognized by others as a major channel of relational information, indeed, a crucial cog in the network, occupying a central location." These results show that NBCC plays a central role in the community.

An Internet search for NBCC results in the following description: "The mission of the Coalition is to organize people and resources which are dedicated to improving the quality of life in Northern Berkshire." The results presented here empirically demonstrate the success of NBCC at linking to organizations in the community. We must go one step further, however, and state that the results also empirically demonstrate the success of the community in organizing itself around NBCC for community improvement.[11] In interpreting the results in *Table 1* it is important to remember that the links of an organization are both incoming and outgoing. *Thus NBCC's ties are the result of both its efforts to bring people together and the choice of people from many organizations to participate on its committees and with its initiatives.*

An Organization's Position in the Network: Betweenness Centrality
Two organizations may not link with each other, but they may each link to a third organization. That third organization is *between* the two in that it provides a path by which they can communicate with or otherwise reach each other. We can explore the extent to which an organization can facilitate the flow of information in the network by virtue of being between many pairs of organizations that are not otherwise linked.

In this measure, an organization is central if it lies on a path between other organizations. An organization with a large *betweenness centrality* is on the path between many pairs of organizations (Wasserman and Faust 1994: 189).

Figure 1 draws on a subset of the community network data to illustrate the concept of betweenness centrality. MASS MoCA is linked to all of the organizations in *Figure 1* except Williamstown Elementary School. In this subset network, information that needs to flow from MASS MoCA to Williamstown Elementary has to go through either the Town of Williamstown or Williams College. In this sense, the Town of Williamstown is *between* MASS MoCA and Williamstown Elementary, and plays a potentially important role in the flow of information through the network. The same is true for Williams College.

MASS MoCA's betweenness position is even more important. In this subset network, all information that flows between North Adams organizations on the right and Williamstown organizations on the left must go through MASS MoCA. MASS MoCA has a high betweenness centrality in this subset network because it lies on many paths connecting pairs of organizations.

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[11] These results support our historical analysis that the community as a whole became part of a campaign to regenerate North Adams once it was clear that the creation of MASS MoCA was moving ahead. See both our historical context paper and our neighborhoods paper. C^{3}D Report NA1.2006, Ibid. footnote 2 and Kay Oehler, Stephen C. Sheppard, Blair Benjamin, and Lily Li. 2006. "Shifting Sands in Changing Communities: The Neighborhoods of North Adams, Massachusetts." C^{3}D Report NA2.2006.

Figure 1
Example of Betweenness Centrality with a Subset of the Community Network
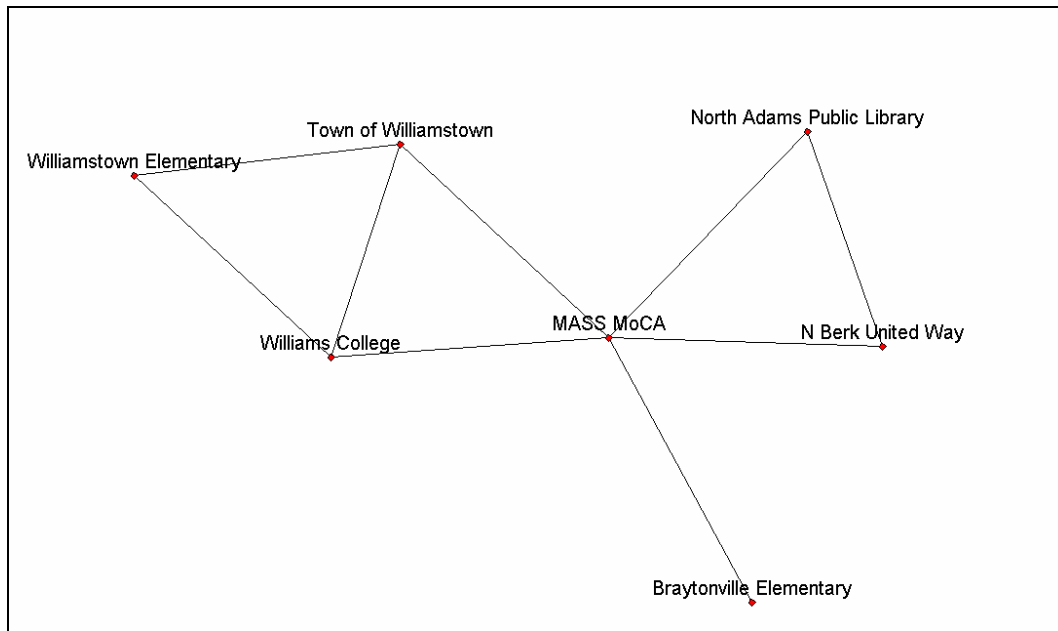

Table 2 presents the betweenness centrality scores for each organization in the *Figure 1* example. The betweenness centrality index has a range from 0 to 1. It is standardized such that it can be compared to other organization indices and can be compared across networks. It is calculated as the sum of paths that an organization lies along, standardized for the size of the network.[12] In *Figure 1*, if we examine all pairs of organizations we see that MASS MoCA lies on 11 of the paths.[13] The maximum possible number of paths in the subset network is 15. MASS MoCA's betweenness centrality score in this map is 11/15=.733. The Town of Williamstown and Williams College both have a betweenness centrality score .133.

Table 2
Betweenness Centrality Scores for Organizations shown in Figure 4

Organization	Score
MASS MoCA	0.733
Town of Williamstown	0.133
Williams College	0.133
Brayton Elementary	0
North Adams Public Library	0
N Berk United Way	0
Williamstown Elementary	0

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[12] The most paths an organization can lie within is (g-1) (g-2)/2 where g is the total number of groups.
[13] A path is also called a geodesic in the network literature. The pairs of organizations that have MASS MoCA on their path are: NAPL-BE, NAPL-TW, NAPL-WC, NAPL-WE, NBUW-BE, NBUW-TW, NBUW-WC, NBUW-WE, BE-TW, BE-WC, BE-WE

Table 3 presents the betweenness centrality score for each organization in the community network with a score greater than zero. Organizations with a score of zero do not lie between any two organizations.

Table 3
Betweenness Centrality Scores for Each Organization in the Community Network
With a Score Greater than Zero

Organization	Betweenness Centrality Score
N Berk Community Coalition	0.275
MA College of Liberal Arts	0.186
Williams College	0.117
SteepleCats baseball	0.082
Images Cinema	0.046
Mt Greylock Regional High School	0.043
City of North Adams	0.037
Neighborhood Expos	0.034
Williamstown Rural Lands Foundation	0.034
MASS MoCA	0.031
N Berkshire United Way	0.029
Town of Williamstown	0.028
N Berkshire Creative Arts	0.021
Williamstown Theatre Festival	0.015
Contemporary Artists Center	0.014
Williamstown Youth Center	0.008
Williamstown Public Library	0.006
Drury High School	0.005
North Adams Public Library	0.004
The Clark art museum	0.003
C3D research center	0.002
Inkberry literary arts center	0.002
McCann Vocational High School	0.002
Pine Cobble School	0.002
Village Ambulance Williamstown	0.002
Freedman DeRosa Rondeau Law	0.001

The results presented in *Table 3* are consistent with the degree centrality results presented in *Table 2.* Northern Berkshire Community Coalition, Massachusetts College of Liberal Arts, Williams College, and the SteepleCats collegiate baseball team are ranked 1 through 4, respectively, with both the degree centrality index and the betweenness centrality index. *Table 4* shows the rank of each organization on the two measures.

In examining *Table 4* one example of a gap in rank between the two measures is for Mt. Greylock Regional High School, which has a degree centrality rank of 20 and a betweenness centrality rank of 6. This indicates that Mt. Greylock does not have a particularly high number of links to it, but is on the path for more pairs than most other organizations. Thus, when it is important for information to flow through the network, Mt. Greylock plays a relatively central role in that flow.

Table 4: Comparing the Rank of Organizations on Two Centrality Measures

Organization	Degree Centrality Rank	Betweenness Centrality Rank
Northern Berkshire Community Coalition	1	1
Massachusetts College of Liberal Arts	2	2
Williams College	3	3
SteepleCats Baseball	4	4
Neighborhood Expos	5	8
Town of Williamstown	6	12
City of North Adams	7	7
MASS MoCA	7	10
Images Cinema	9	5
Northern Berkshire United Way	10	11
Williamstown Rural Lands Foundation	11	8
Northern Berkshire Creative Arts	11	13
Williamstown Theatre Festival	13	14
Contemporary Artists Center	14	15
Drury High School	14	18
McCann Vocational High School	14	21
North Adams Library	17	19
The Clark	17	20
Inkberry	17	21
Mt Greylock Regional High School	20	6
Williamstown Youth Center	20	16
Milne Public Library (Williamstown)	20	17
C3D Research Center	20	21
Berkshire Family and individual resources	20	27
Village Ambulance (Williamstown)	25	21
North Adams School Committee	25	27
Pine Cobble School	27	21
Freedman DeRosa & Rondeau Law	27	26
Community Chest (Williamstown)	27	27
Hoosic River Water Shed Association	27	27
North Adams Police	27	27
Community Service Learning	32	27
Donovan & O'Connor Law	32	27
Brayton Elementary School	32	27
Village Ventures	32	27
Neighborhood Leaders	36	27
Williamstown Elementary School	36	27
Williamstown Film Festival	36	27
Wild Oats Food Coop	36	27
Big Brothers Big Sisters	40	27
Buxton School	40	27
Guernsey Law	40	27
North Adams Fire Department	40	27
Overland	40	27
WilliNet Community TV	40	27
Williamstown Police	40	27

Berkshire Arts&Technology Charter School	47	27
Orthopedic Associates of N. Berkshire	47	27
Robert C. Ware Law Offices	47	27

Describing the Network: Cutpoint Organizations

In addition to examining the location of organizations within the network, we can examine characteristics of the network as a whole. One question we might ask is if there are any points (organizations) in the network that, if removed, would result in the network splitting into two or more parts. Such points are called *cutpoints*.

Following Wasserman and Faust (1994:112ff), an organization is a *cutpoint* if its removal results in the network splitting into two or more sub-networks.[14] *Figure 2* presents an example of a cutpoint in the subset-network used above. Cutpoint organizations are represented in *Figure 2* by a purple node.

Figure 2
Example of Cutpoints in a Subset of the Community Network
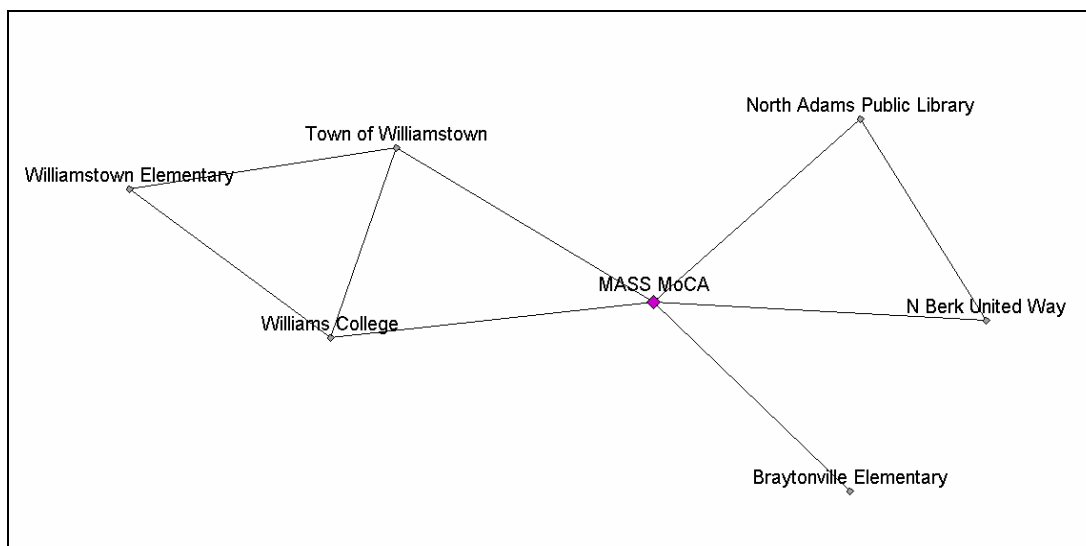
In *Figure 2*, MASS MoCA is the only cutpoint organization. *Figure 3* shows what would happen if MASS MoCA were removed from this network. The single network mapped in *Figure 2* would break into two sub-networks and an isolated Brayton Elementary School. Without MASS MoCA, the Williamstown organizations would be linked only to each other, and the North Adams Public Library and Northern Berkshire United Way would be linked, but there would be no path for information to flow between the two sub-networks. Examining the spots where an organization plays a cutpoint role in the community highlights its important role in connecting different sub-networks.

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[14] A *bridge* is a similar concept except that it refers to an individual (line) whose removal would result in the network being split into two or more sub-networks.

Figure 3
Cutpoint Example: Subset Network with MASS MoCA Removed
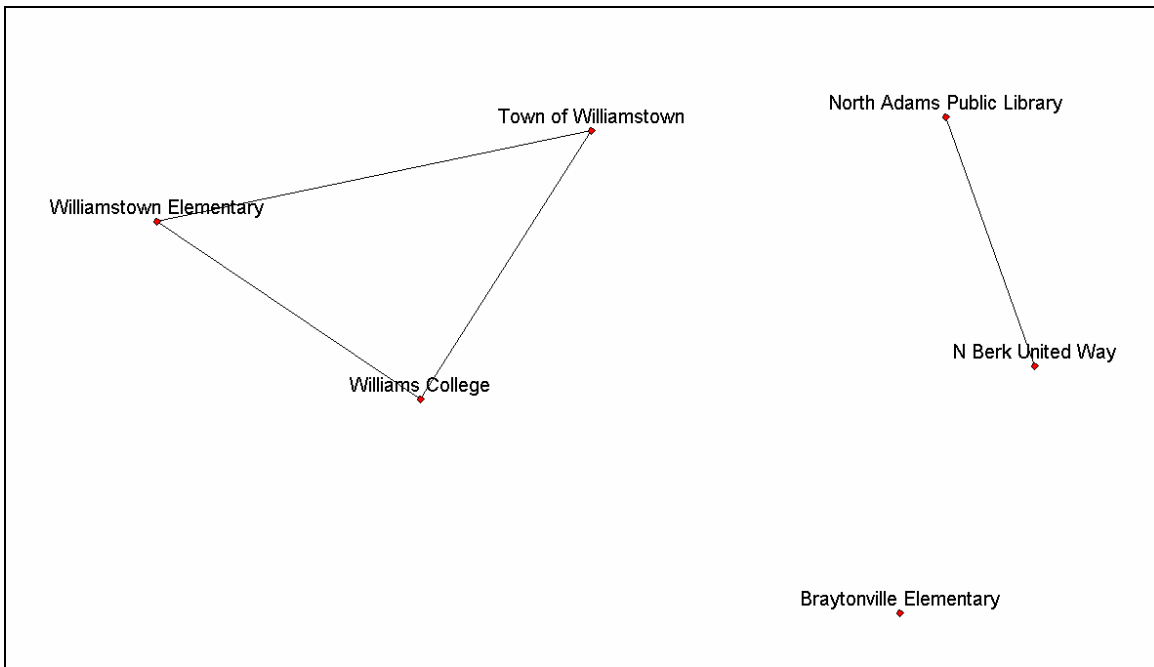
When we analyze the entire community network, we find that there are three cutpoint organizations: Northern Berkshire Community Coalition, SteepleCats, and Mt. Greylock Regional High School. In each case, the removal of one of these organizations results in a single organization becoming an isolate. Thus, while cutpoints can play a significant role in holding a network together, in this case there is no single organization whose removal would dramatically affect the network. This is due to the fact that organizations in North Adams/Williamstown tend to be linked to the network in multiple ways.

Describing the Network: Descriptive Statistics
There are some simple measures that can be used to describe the network as a whole, and to make comparisons among networks. *Table 5* presents some statistics that can be used to describe the network as a whole.

Table 5
Descriptive Statistics of the Community Network

Number of Organizations	49
Number of Links	211
Density of Network	0.179
Average Degree	4.306
Mean Distance	1.986
Diameter	4

There are 49 organizations that are linked in the community network. There are 211 links between organizations that have been formed by individuals.[15]

The *density* of the network measures the percentage of all possible links between pairs of organizations that actually exist. The density of the community network is 0.179, which means that 18% of all possible links between organizations actually exist. Density has a range from 0.0, if no organizations are linked, to 1.0, if every organization is linked to every other organization.

The *average degree* of the network is 4.3. That indicates that, on average, an organization has 4 links with other organizations.

The *mean distance* of a network is the average number of steps between any pair of nodes in a network. The mean distance of the community network is 1.986.

The number of steps between two organizations is called their geodesic distance. In *Figure 2*, for example, it takes two steps to go from Williams College to Northern Berkshire United Way: the first step is Williams College to MASS MoCA; the second step is MASS MoCA to Northern Berkshire United Way. The *mean distance* indicates that, on average, an organization can reach another organization in two steps (i.e., by going through just one other organization).

The *diameter* of this network is 4. The diameter is the largest geodesic distance between any pair of nodes in the network. Thus, the pairs of organizations most distant from each other are 4 steps away from each other. Information that needs to pass from one of these organizations to the other would have to pass through 3 other organizations along the way.

MASS MoCA's Primary Network
One advantage of mapping a community network is that it is then possible to extract the primary network of any organization within it. We can return to our initial questions about the role of MASS MoCA and cultural organizations in general within their community.

- Does MASS MoCA (and cultural arts organizations in general) have ties in the community that go beyond ties to other cultural arts organizations?
- In what ways is MASS MoCA actively involved in the social improvement of the community, i.e. beyond being an engine for economic regeneration and beyond programming offerings (and, more generally, how can this be a model for other cultural arts organizations)?
- How can MASS MoCA empirically communicate its social involvement and commitment to the community in such a way that the public, the city government, its own board of trustees, and potential funders can understand and value that commitment (and that other cultural arts organizations can use as a model for their own efforts)?

We have three lists of individuals associated with MASS MoCA: staff, the board of directors, and volunteer ushers. There are 74 staff members; 28 board members; and 38 volunteer ushers, for a total of 140 individuals associated with MASS MoCA. *Figure 4* displays the direct links

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[15] Two organizations are either linked or not linked; we do not count the total number of individuals who might possibly link them.

between MASS MoCA and other organizations in the community.[16] It maps what we call MASS MoCA's Primary Network, consisting of the organizations in the community with which MASS MoCA has *direct* links.

Figure 4
MASS MoCA's Primary Network
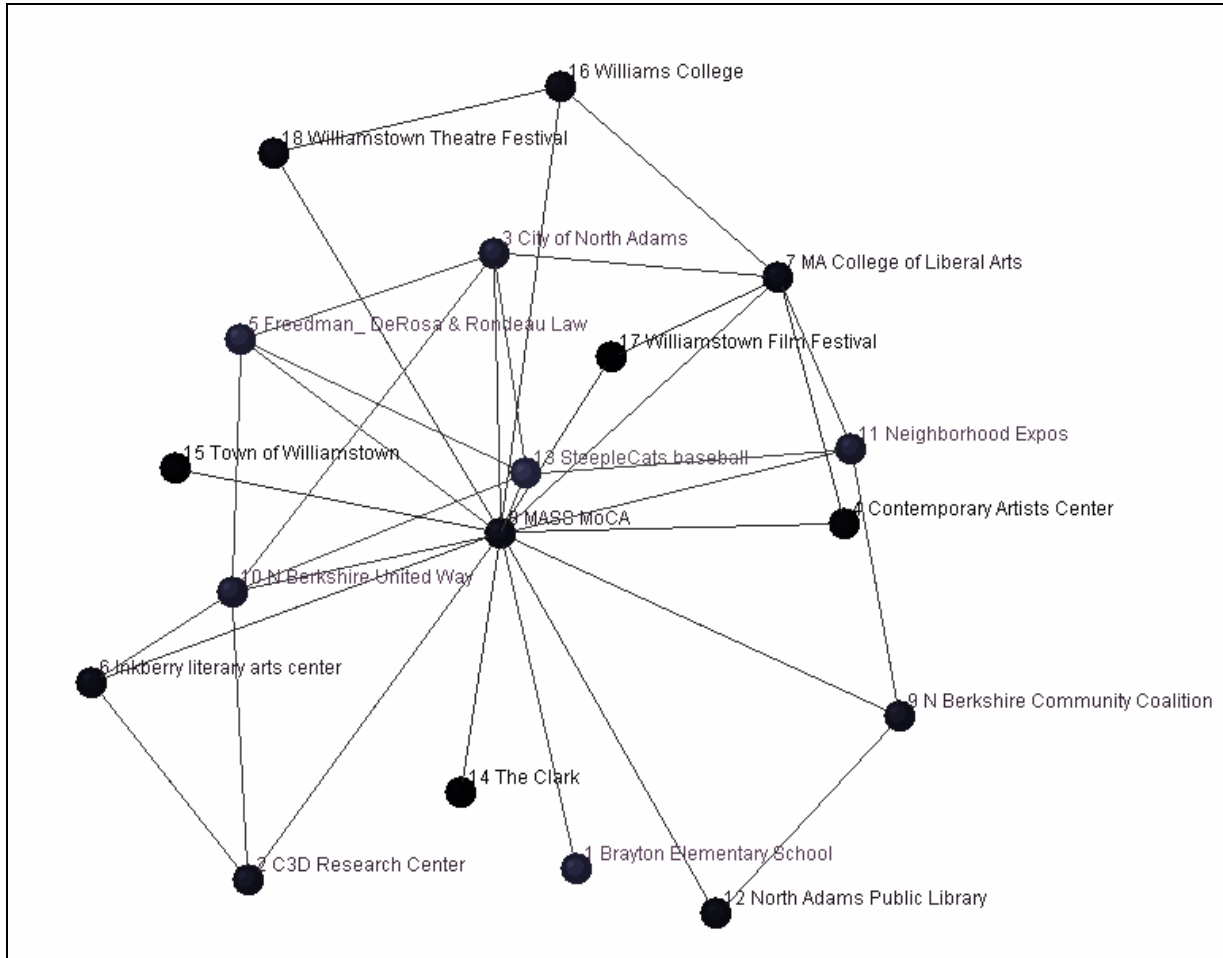
Of the 140 individuals associated with MASS MoCA, 42 are currently on our lists linking MASS MoCA to 17 organizations in the community. Thus MASS MoCA's *degree* is 17. *Table 6* lists the organizations with which MASS MoCA is linked, along with the type of organization it is. MASS MoCA is linked to a wide variety of organizations, including other cultural organizations and those in education, leisure, the professions, the social services arena, and the public sector.

Since an organization does not link with itself, MASS MoCA has 17 of a possible 48 links for a *degree centrality* of .354.

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[16] It is important to note that these are links involving *only* individuals with a direct connection to MASS MoCA: its staff, board of directors, and volunteer ushers. In the community network, for instance, there is a direct link between C3D and MCLA (via Stephen C. Sheppard, director of C3D), but that link is not shown in MASS MoCA's Primary Network because the individual is not directly linked to MASS MoCA.

Table 6
Organizations Linked to MASS MoCA and their Sector

	Organization	Type	# Links
1	Brayton Elementary School	Education	1
2	Center for Creative Community Development (C^{3}D)	Education	1
3	City of North Adams	Public Sector	2
4	Clark art museum	Culture	1
5	Contemporary Artists Center (CAC)	Culture	2
6	Freedman, DeRosa & Rondeau Law Firm	Professional	1
7	Inkberry literary arts center	Culture	1
8	Massachusetts College of Liberal Arts (MCLA)	Education	5 or more
9	Northern Berkshire Community Coalition (NBCC)	Social Services	4
10	Northern Berkshire United Way (NBUW)	Social Services	2
11	Neighborhood Expos	Social Services	5 or more
12	North Adams Public Library	Public Sector	1
13	SteepleCats collegiate baseball team	Leisure	5 or more
14	Town of Williamstown	Public Sector	1
15	Williams College	Education	3
16	Williamstown Film Festival	Culture	1
17	Williamstown Theatre Festival	Culture	1

Two things can be learned about MASS MoCA's role in the community from its Primary Network:[17]

- *MASS MoCA is heavily linked to the most central organizations in the community.* It has five individuals involved with the Neighborhood Expos, Massachusetts College of Liberal Arts, and the SteepleCats; four individuals involved with Northern Berkshire Community Coalition; and three individuals involved with Williams College. If we return to *Table 4* for a moment we will see that all of these organizations are in the top most highly ranked in the community in terms of both degree centrality and betweenness centrality.

- *MASS MoCA is positioned to be a coalition builder.* MASS MoCA is linked to many organizations in the community *and it links them to each other.* If the lines in *Figure 4* radiated out from MASS MoCA only, like spider legs, it would indicate each individual involved with MASS MoCA was involved with only one other organization. The fact that we see crossover links between organizations (triangles in *Figure 4*), however, indicates greater potential for coalition building. The crossover links represent individuals involved

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[17] In examining *Figure 4* and its associated *Table 6*, keep in mind that all of the links displayed are made by MASS MoCA people: staff, board members, and volunteers. These individuals link MASS MoCA to 17 community organizations, and link many of those organizations to each other. 23% of all possible links in MASS MoCA's primary network have been made. This compares with 18% of all possible links in the community network as a whole.

in a set of organizations. This allows information to flow more quickly through the network and for new initiatives to emerge.[18]

In *Table 7* we describe MASS MoCA's primary network the same way we described the community network.

Table 7
Descriptive Statistics of MASS MoCA's Primary Network

Number of Organizations	17
Number of Links	70
Density of Network	0.229
Average Degree	3.889
Mean Distance	1.771
Diameter	2

Due to the fact that MASS MoCA's Primary Network is a subset of the community network, it is not very interesting to compare the descriptive statistics of the two. These descriptive statistics would be of interest, however, in comparing the primary networks of different organizations in the community and different *types* of organizations.

Discussion
We return to the three questions posed at the beginning of this paper concerning the role of MASS MoCA in particular and cultural organizations in general in their community. It is possible to provide brief answers to these questions based on the community network analysis provided here.

1. *Does MASS MoCA (and cultural arts organizations in general) have ties in the community that go beyond ties to other cultural arts organizations?*

An examination of MASS MoCA's Primary Network has shown that MASS MoCA has direct ties to the Educational sector; Social Services sector; the Leisure sector; the Public sector; and the Professional sector, as well as ties within the Cultural sector. The concern that is sometimes expressed that cultural organizations are insular, only interacting with each other, is unfounded in the case of MASS MoCA's position in North Adams. Further research is needed to see if it is unfounded in many, if not most, instances.

We have seen that MASS MoCA is heavily linked to the most central organizations in the community, and to organizations, such as the Northern Berkshire Community Coalition, that set as their mission bringing people together to strengthen the North Adams community. As a result, the towns of North Adams and Williamstown are currently more interconnected than we expected, especially given the negative sentiments about North Adams that were expressed a decade ago, and the economic differences that remain between the two towns.

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[18] To develop a measure of coalition building engaged in by an organization, we would need to take into account both the number of organizations it is linked to and the density of its primary network. An organization's primary network may have high density, but it may be linked to only a few other organizations in the community.

MASS MoCA plays an important role in linking the two towns, as illustrated in the example in *Figure 2*. Because North Adams' success depends, in large part, on its successful incorporation into the growing cultural-tourism economy of Berkshire County, these links to Williamstown are vital. Especially with its geographical location in the far northwest corner of the county and the state, it would be at risk of remaining culturally and economically isolated otherwise. Further exploration of the links between North Adams and Williamstown are in order.

2. *In what ways is MASS MoCA actively involved in the social improvement of the community, i.e. beyond being an engine for economic regeneration and beyond programming offerings (and, more generally, how can this be a model for other cultural arts organizations)?*

MASS MoCA is actively involved in the social improvement of North Adams, and the network analysis empirically verifies this. MASS MoCA has strong ties to the social services sector. It is linked to the social service organizations most active in North Adams, and with proven records as coalition partners.

Further exploration of the coalitions identified in *Figure 4* is in order. As discussed in Footnote 11, while all of the linkages have the potential for the flow of information (and resources), only a subset are active at a given point in time. Ethnographic exploration of the linkages shown in *Figure 4* would enrich our understanding of the specific programs and collaborations in which MASS MoCA is currently involved.

3. *How can MASS MoCA empirically communicate its social involvement and commitment to the community in such a way that the public, the city government, its own board of trustees, and potential funders can understand and value that commitment (and that other cultural arts organizations can use as a model for their own efforts)?*

The results of social network analysis can be an additional resource for the cultural arts organization in communicating its involvement in the community. For instance, with a map of its primary network, a cultural arts organization could demonstrate its collaborative potential in grant proposals.

Additionally, the results of social network analysis could be part of strategic planning within the organization. With a map of its primary network, a cultural arts organization might better assess the community resources available to it. It could examine the types of organizations to which it has access, and that have access to it, and potentially reach out to new types of organizations.

Network analysis has a real benefit when done on the entire community. This allows the cultural arts organization to bring something of community value 'to the table,' and can help initiate a community-wide discussion about identity and goals. 'Before' and 'after' network maps can be used as an evaluative tool for program initiatives with a goal of building new coalitions or of making the community more cohesive.

Conclusions
This research reports on a preliminary attempt to map the social network of the North Adams / Williamstown community, and to identify MASS MoCA's place within it. It was also motivated by the desire to see if social network analysis could be applied in a useful manner to the study and evaluation of cultural organizations' programs for regenerating their community.

The results are promising. Using existing network analysis programs, data collection methodologies, and analysis tools we have addressed three questions that have been raised in the past about the role of cultural arts organizations in their community.

We conclude that the most informative network analysis is one that gathers information on the entire community. This allows an evaluation of the extent to which the community is interconnected and information can flow between many organizations. Having a map of the community network can help a community visualize where it is and where it would like to go. Having a community network allows one to pull out any individual organization in the community and provide a map of its primary network.

With further research, it might be possible to develop a typology of networking styles that cultural arts organizations display. One possible element in that typology might be 'coalition builder', a role that we saw MASS MoCA playing. Another element might be the 'isolationist,' representing organizations with zero or possibly only one link to other organizations in the community. With an extended typology, a cultural arts organization might assess its role and evaluate ways to become a more active participant in the community.

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