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THE APPLICATION OF NETWORK ANALYSIS TO THE STUDY OF TRIAL COURTS*

SALMON A. SHOMADE AND ROGER E. HARTLEY

In the late 1960s, scholars began studying trial courts as organizations. Since the last large wave of these studies in the 1990s, there have been reforms that purport to alter state court institutions. The literature on trial courts has not yet addressed how reforms, like specialized courts, alter trial courts as organizations. Studies of trial courts could also profit from the application of other methods for analyzing organizations. This article explores the use of network analysis to examine the organizational linkages and structure of trial courts. After reviewing the literature on trial courts and recent court reforms, we make a case for the utility of this methodological approach. Recent computer applications of network analysis can visually map the linkages between trial court actors and the organizations that work with them. As a demonstration, we provide some of the results of our study of a state trial court located in a medium-size U.S. city. We conclude by arguing that network analysis as a technique can help scholars test past assumptions about the organization of courts and explore new linkages that are proposed by the adoption of court reforms.

Political scientists and criminal justice scholars have made great strides in the study of trial courts since Abraham Blumberg's seminal organizational study in 1967. Several studies of the organization of trial courts were performed in the 1970s, 1980s, and early 1990s (see Eisenstein and Jacob, 1977; Eisenstein, Flemming, and Nardulli, 1988; Flemming, Nardulli, and Eisenstein, 1992; Nardulli, 1978; Nardulli, Eisenstein, and Flemming, 1988), but there has been less attention since. While this scholarship is impressive, there have been several changes to the structure of trial courts since then. These changes necessitate continuing inquiry into the organization of trial courts. Recent changes to trial court systems include increased unification of some state court systems, more policy attention to case management and court efficiency, the addition of alternative dispute resolution, and the rise in specialty courts. While scholars have commented on the difficulty of reform to American courts (Feeley, 1983; Hays, 1978), the fact that new reforms continue to be adopted provide further reason to study courts as organizations. For instance, specialty courts, which bring treatment to offenders, are said to alter the structure, process, and the very nature of trial courts (Douglas and Hartley, 2004; Nolan, 2001; Tobin, 1999).

The fact that the structures of some trial courts have changed is only one reason to conduct new research on trial courts. There are also organizational theories and methodologies—like the study of networks—that are useful for examining how trial courts work and how changes to these courts might influence court stakeholders.

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One of the inadequacies of past studies is the lack of a common methodology that can be used to easily compare and contrast the organizational structures of trial courts and how they might change over time. Network analysis, as a method, provides such a means of comparison that employs quantitative and qualitative data to assess the interactions of organizations and their actors. This assessment can then be represented as a computer-generated visual map of the organization with its nodes of interaction and linkages between influential or critical and less critical court actors.

Network analysis measures such concepts as "centrality," "structural equivalence," or "role equivalence" to assess the nature of the relationships among actors within organizations. Employing network analysis to measure concepts such as "density" and "reachability," scholars can differentiate networks within the same organization or compare networks across different organizations. Specifically, network analysis allows scholars to simultaneously measure several critical dimensions related to the current dynamics of today's trial courts. Scholars can also measure the strength of ties among players of each unit or subunit of a particular trial court and, at the same time, determine the number of connections among the various units or subunits of an umbrella trial court system. For example, the results of such measurements could help determine whether the actors in a trial court are functioning as court managers and presiding judges expect. The results could also help a court manager or a presiding judge decide what organizational changes or reforms are best to adopt. Network analysis, more systematically, could help scholars retest past conclusions of studies and generate hypotheses for future research.

Variations of network analysis have been employed in some public-law studies of attorney networks (Heinz and Laumann, 1994; Heinz et al., 1997; Heinz, Paik, and Southworth, 2003), the criminal justice system (Heinz and Manikas, 1992), and Supreme Court precedents (Fowler and Jeon, 2008). However, we believe that new network analysis techniques and theories are useful to apply to trial courts and that they might be able to address some of the inadequacies of past trial court studies described by Jacob (1983b). In the following section, we discuss recent reforms affecting trial courts and what changes have occurred to them that necessitate their reexamination.

REFORMS AFFECTING TRIAL COURT ORGANIZATION

During the 20th century, court reform movements in state courts took place separately from changes in the federal court system (Feeley, 1983). In the early 20th century, Congress, sometimes at the behest of the Supreme Court, was instrumental in changing the federal court administrative system. However, reform on the state level tended to be initiated by one state and diffused to other states. By the middle of the 20th century, court reform movements at the state level went in predominantly two directions: one set of reforms targeted judges while the other set focused on organizational reforms (Tobin, 1999). As to judges, progressive reformers concentrated on merit selection of judges, expansion of judicial compensation, judicial discipline codes, judicial education, and judicial evaluation (Tobin, 1999).

The primary reform to the organization of state courts at this time was "court unification." Unification efforts continue in state courts to this day. The focus of unification has traditionally been on court structure, budgets, and administration of the state court system.

Structural unification would create a single or two-tiered trial court with general-jurisdiction and limited-jurisdiction courts under one system and even one roof. Budgetary unification focused on creating statewide financing of the trial court system and centralized budgeting. This reform shifted more power to state governments and state court officials from the local level. Administrative unification emphasized centralized policymaking for the entire court system and a wider use of judicial rulemaking power at the state level.

Together, these three pieces of unification showcase the problems inherent in a loosely coupled,¹ decentralized organizational structure of courts. For instance, budget and administrative unification theoretically shifts power from the local to state level. Structural unification theoretically changes the structure and networks of courts at the local level. One way to assess the impact of these changes is to examine the vertical and horizontal administration and organization of trial courts. How do trial court officials interact with state administrators under unified and more localized organizational schemes? Are the linkages between state and local actors as tightly coupled as reformers supposed? Likewise, scholars might discover that criminal courts that have incorporated specialty courts (as we further elaborate below) have tighter-coupled organizations now than before incorporation.

In addition to court unification, other reforms have been adopted in state court systems that are based, in part, on popular dissatisfaction with the courts. In the 1970s, worries about dissatisfaction with our nation's courts drew the attention of judges, attorneys, court managers, and scholars. As a result, reforms were adopted to deal with such issues as efficiency, timeliness and fairness, accountability, inadequate methods of judicial selection and discipline, excessive political influence, and lawyers manipulating the legal system. Tobin (1999) notes that some of these reforms include 1) making changes in the adversarial system (e.g., ADR), 2) adapting the role of judges to expanded social responsibilities (e.g., posttrial monitoring and implementation of decisions); 3) moving toward a more open, service-oriented style of court (e.g., more collaboration with citizens, improved customer service); and 4) developing specialized courts (e.g., mental-health courts, drug courts, DUI courts, and family courts).

Specialized courts merit attention because of their potential impact on trial courts as organizations. These courts (e.g., drug courts, mental-health courts, and DUI courts) were created because some judges and court managers were weary of certain societal problems that manifest themselves in criminal actions (see Nolan, 2001, on drug courts). After seeing the same defendants and problems time and again in their courts, some local officials came to believe that these societal problems could not be remedied by the typical criminal trial court process and punishment (Winick and Wexler, 2003). By providing structured therapeutic programs that combine punishment and treatment, specialty courts bring judges, defense attorneys, prosecutors, and nonprofit organizations together to focus on the problems that offenders and their families face (e.g., mental illness and addiction). They are also said to have the effect of actually decentralizing courts in the face of movements that have sought to unify them (Nolan, 2001). On the other hand, internally, specialty courts may more tightly

¹Hirschhorn defines "loosely coupled" systems as "settings where individual elements have high autonomy relative to the larger system that they are in, often having a federated character." Hirschhorn further explains that in a loosely coupled setting, the "central authority is derived as much from the members versus the member elements receiving delegated authority from above" (1994:1). See also Karl E. Weick's 1976 seminal piece "Educational Organizations as Loosely Coupled Systems" for additional descriptions and functions of loosely coupled organizations.

couple and unify prosecutors, defense attorneys, probation officers, judges, and external groups like treatment centers. Unfortunately, there are very few studies of how these specialty courts alter the administration and organization of trial court systems.

In summary, the movement by trial courts to become more performance oriented and responsive to user needs brought institutional changes that necessitate more study of court organization. The organizational linkages among court actors, then, may be changing as court institutions change. Recent court reforms, like specialty courts, link courts more closely with other organizations, like nonprofits and other governmental agencies. These changes may "widen" the network of what Heinz and Manikas (1992) see as a rather closed and isolated system of trial court actors. Other reforms, like unification, may more tightly link trial courts within the overall state court hierarchy. Even in jurisdictions that retained non-unified court systems, external agencies such as treatment centers and employment agencies are increasingly becoming part of the trial court's landscape. Nonetheless, there is insufficient literature on how they change the structure of trial courts. As such, these reforms or changes may provide new "nodes" of interaction, which could alter the local legal culture and norms of trial courts found in past studies. In addition, these reforms point to a need to study trial courts in ways that help us assess and measure changes in their organizations.

THE NEED FOR ADDITIONAL COURT STUDIES

Past studies of trial courts exemplified the importance of organizational structure, the behavior of court actors, and how the actors interact to achieve justice (e.g., Blumberg, 1967; Eisenstein and Jacob, 1977; Eisenstein, Flemming, and Nardulli, 1988; Flemming, Nardulli, and Eisenstein, 1992; Jacob, 1983a; Nardulli, 1978; and Nardulli, Eisenstein, and Flemming, 1988). However, more study of trial courts as organizations is needed (Jacob, 1983b). This is especially true when we examine the processing of civil cases (Flemming, 1998), trial courts in other national settings (Rock, 1993), and reforms to courts (Jacob, 1997). Studies also need to be updated to reflect new methodologies and theories that are used to study organizations in other fields.

Most studies of trial courts focus on criminal courts in the United States (but see Rock's 1993 study of Great Britain). As Jacob (1983b) noted, little is still known about the organization surrounding the processing of civil cases. However, there are studies that explore the behavior of court actors in civil courts (e.g., Mather, McEwen, and Maiman, 2001) and how reforms might alter the court environment and actor behavior (Hartley, 2002). Civil courts need to be studied as systems because they have different organizational networks from those of criminal courts. The relationships of actors in civil cases may be even more loosely coupled than in the criminal variety, because civil cases do not necessarily have the same repeat interactions found between members of prosecution and public defender offices. However, some reforms to civil court systems, like mediation centers, might provide new opportunities for repeat interactions in the court network (see Hartley, 2002). As a result, scholars may find a tighter coupled organization of court actors in a civil case system after reform.

The literature on court reforms shows the need for assessing how institutional changes alter the networks of trial courts. The application of "new institutionalism" to public law reminds court scholars that alterations in institutions come from the interests of actors who find them valuable to enact. Institutional changes may have the impact of changing the behavior of actors that work within the new institution,

but may also change the behavior of other actors that are affected by them. As a result, the intended and unintended reactions of actors may be assessed by examining how organizational networks change in response to reform.

Reforms to court structure, like unification, that link trial courts closely within the broader state court system necessitate that scholars continue to study how courts interact with other organizations. Separately, reforms inside trial courts should also draw the attention of scholars. For example, specialized courts, like the drug and mental-health variety, provide a unique network of judges, attorneys, and treatment communities that interact in a setting dedicated to the therapeutic needs of the offender (Nolan, 2001). These repeat interactions are different and may more strongly couple criminal court actors than the interactions found in Jacob's (1997) study. Externally, drug courts might link and expand the networks of criminal courts from relative isolation to other organizations, like nonprofit treatment providers and other governmental organizations that provide social "wraparound" services.

Finally, there are reasons to study trial courts with new methods. With a few notable exceptions (see Ostrom et al., 2007), the past literature has not provided court scholars with a transferable and adaptable model that can be used to understand and compare the operations and organization of trial courts (Jacob, 1997). There are several competing methods and units of analysis used by researchers to study trial courts. Some studied litigation patterns to assess how courts function and the work that they produce (Friedman, 1983). Others categorized case types and rates by the major participants in courtrooms and assessed the participants' responsiveness (Nardulli, 1978). In other studies, trial courts were examined as systems or as organizations (e.g., Eisenstein and Jacob, 1977; Jacob, 1983a, 1997). As a result, there is a lack of cumulative knowledge to be applied to other settings (Jacob, 1983b). It would be useful to apply a single model or method of study that is applicable for measuring the behavior of all the participants and stakeholders in the system.

In a recent study of trial court culture, Ostrom and colleagues (2007) demonstrate the utility of having an adaptable model for understanding interactions among judges, lawyers, court managers, and other stakeholders. They show that a trial court's organizational performance (e.g., timeliness, fairness, and management effectiveness) is closely tied to the culture of the court. They note:

Judges and court managers recognize that no single culture is necessarily the most appropriate or efficacious in all situations. Courts demonstrate sensitivity to the complex nature of culture by preferring a distinct combination of cultures across different work areas. Specifically, the courts under study desire to move to a cultural orientation with a hierarchical emphasis in *case management style* and *change management*, a networked emphasis in *judge-staff relations* and *internal organization*, a communal emphasis in *courthouse leadership* (2007:137; emphasis provided).

Ostrom and his colleagues' effort to create and test replicable measures of legal culture demonstrates that contemporary organizational theory holds great promise for the study of court systems. There is still a need for more studies on how trial courts function and particularly how trial court actors interact with other court and non-court organizations. The structure of these internal and external relationships may provide a clearer picture of what the organization and work of a court really looks like. The strength of linkages among court actors and between court and non-court actors can help scholars and policymakers better understand the culture of courts. Who

are critical players in the court community and what actors have the strongest and weakest ties among those who do the judicial administration work? How strong are the ties between court actors and other local government agencies? Which actors interact with others the most and under what conditions?

The application of contemporary organizational theory provides new methods, measures, and theory that can be used to retest conclusions from past studies. This is especially important because of the numerous structural reforms to the court systems of old. Work like that of Ostrom and his colleagues (2007) on legal culture provides advancements using organizational theory. Another promising avenue, and the subject of this article, is the application of network analysis to the study of trial courts. In the next section, we assess the utility of network analysis by reviewing how it has been used by organizational theorists, scholars of social networks, and even public-law scholars in other settings.

EXPLORING NETWORK ANALYSIS

Different academic fields and subdisciplines, like social-network theorists and organizational theorists, approach the theory and study of networks in different ways. However, the analysis techniques and methods born from the study of networks can be useful in and of themselves as tools to study the relationships between actors and how they form networks. Network theory and network analysis are difficult to separate. Network theory seeks in part to explain how actors behave in relation to each other, while network analysis is a methodology or tool for analyzing these interactions and relationships. In trial courts, the network approach can help us make sense of how court reforms change the relationships of persons who make and implement policy in the justice system.

In addition to assessing the relationships within organizations, the network approach has proven especially useful in studies at the interorganizational level. Provan and Milward (1995) maintain that "differences in network effectiveness could be explained by aspects of network structure and context, namely centralized integration, external control, stability, and resource munificence" (p. 27). These authors illustrate how interorganizational networks that are centralized around a coordinating agency generate better outcomes for network clients than interorganizational networks with less centralization. Trial court scholars could similarly use network analysis to assess the impact of court unification by examining how centralized the ties are between different levels of courts or between local courts and state administrative offices of courts. Scholars could also analyze the ties between drug courts and treatment providers in the community.

To date, there has been limited research using network analysis to study topics in public law. Some examples of the existing research help us to illustrate the utility of using this approach to study trial courts. Past studies assessed the networks of professional attorneys (see Heinz and Laumann, 1994), Supreme Court precedents (Fowler and Jeon, 2008), and the broader network of the criminal justice system (Heinz and Manikas, 1992).

Network analysis was used by Heinz and colleagues to study relationships of attorneys in a single time period and longitudinally. In a survey performed in 1975, Heinz and Laumann (1994) used small-space analysis to examine the networks of

elite or "notable" attorneys in the Chicago Bar. In 1997, Heinz et al. published an updated study using a similar survey. As a result, these scholars were able to compare the networks of attorneys to see how the profession had changed over time. These two studies exemplify how changes in the associations of a single group can be studied over time using network analysis.

More related to the subject of trial courts was a study of networks of elites within the criminal justice system as a whole (Heinz and Manikas, 1992). Using a survey of 211 criminal justice administrators, interest group leaders, and news reporters in Cook County, Heinz and Manikas examined the networks between these various government elites and private groups. Using small-space analysis to depict the patterns of the network, the authors found that the clusters of interaction were unexpected. Instead of an expected close relationship between political elites, the judiciary, and the police, Heinz and Manikas found that the judiciary was relatively isolated. The media outlets were strongly linked with law-enforcement agencies, but not with the courts and corrections. Public and private organizations that represented minorities, juveniles, and the mentally ill were on the periphery of the clusters. In the end, government officials were not found in the center of this criminal justice network and, as a result, the network pattern indicated a "hollow core" with an absence of critical power brokers. The results of this study, in particular, provide a start for network studies of trial courts and the impact of reforms. It would be interesting to test if the relationships between courts and their external partners are stronger now that treatment has been incorporated into the justice system, especially in specialized courts, or if unification efforts have more closely connected trial courts.

The above studies provide examples of the utility of network analysis to public-law scholars. Network analysis can help scholars reveal more about trial courts. By studying networks, court scholars can learn about: 1) The interactions of all the various units and subunits of a trial court (e.g., the relationship between benches); 2) The relationships and the vertical linkages among different types/levels of trial courts (e.g., general- and limited-jurisdiction courts); 3) Horizontal linkages among various stakeholders in a particular court organizational structure (e.g., judge, defense attorney, and prosecutor); and 4) The interactions among the principal actors and the external actors (e.g., legislators, county budget offices, and the media). Assessing these horizontal and vertical linkages is useful to understanding the degree of centralization or decentralization of state courts and who their frequent and infrequent partners are in the justice system.

Clearly, exploring the application of the network approach to trial courts indicates a preference of the organizational model over other models that have been used to study trial courts. However, as Herbert Jacob (1983a:214) reminded court scholars, employing organizational concepts to evaluate courts helps court scholars to clarify reform obstacles and enables managers to implement better reforms.

To further illustrate how network analysis could be useful to trial court scholars, we discuss the application of this methodology in a recent study we conducted. Our study demonstrated what network analysis might reveal when used to assess the structure (as defined by the interactions and relationships of participants) of a typical criminal bench operating under a larger umbrella trial court.

Table 1

List of Entities Participating in Criminal or Drug Court Case Disposition

Criminal Court Judges (CCJ)
Office of a Criminal Judge (OCJ)
County Attorneys (CA)
Criminal Bench Administrative Office (CBO)
Public Defender (PD)
Sheriff's Department (SD)
Legal Defender Office (LDO)
Probation Office (PO)
Office of Court-Appointed Counsel (OCAC)
Pima County Pretrial Services (PTS)
Private Counsel (PC)
Superior Court Administrator's Office (SCAO)
Superior Court Calendar Services (CS)
Superior Court Interpreters (INT)
Superior Court Reporters (CR)
Superior Court Jury Commissioner (JC)
Pima County Drug Court Judge (DCJ)
Codac Behavioral Health Services, Inc. (CODA)
Office of a Drug Court Judge (ODJ)*
El Rio Community Health Center (ELR)
Center for Life Skills Development, Inc. (CLS)
Cope Behavioral Services, Inc. (COPE)
Treatment Assessment Screening Center, Inc. (TASC)
La Frontera Center, Inc. (LAFR)

* Similarly as we did for the criminal court entities, we separated the Office of the Drug Court Judge from the Drug Court Judge because the Drug Court Judge represents the bench as a distinct entity, separate from the Office of a Drug Court judge, which is an entity in itself.

STUDYING THE PIMA COUNTY SUPERIOR COURT

From 2006 thru 2007, we studied the trial court of Pima County, Arizona (referred to as a "superior court" or "court"). Arizona has a non-unified court system consisting of limited-jurisdiction courts (justice and municipal courts), general-jurisdiction courts, appellate courts, and a supreme court. The state's superior courts are the state's general-jurisdiction trial courts. At the time of the study, Pima County Superior Court was Arizona's second largest superior court with twenty-eight full-time judges, three full-time judges pro-tempore (temporary judges), and sixteen full-time commissioners.

The superior court is divided into five benches: criminal, civil, probate, family law, and juvenile, and each bench is led by a presiding judge. During the study, the criminal bench had a total of thirteen judges and each judge had his or her own courtroom. Apart from the criminal courts, the criminal bench also consists of two specialty courts: a mental-health court and a drug court. In addition, the superior court has separate administrative divisions, such as the offices of court clerk and the court administrator.

² The authors adopted the questionnaire used by Provan and Milward (1995) for their seminal interorganizational network research. A copy of the questionnaire used in this study is available from the authors.

For our study, we used both qualitative and quantitative data-collection methods. For the qualitative portion, we employed a combination of participant observation, documents reviews, and semi-structured interviews (Yin, 2003). For the quantitative data, we used a network-analysis questionnaire.² Furthermore, for the qualitative portion of the study, we observed several criminal courtrooms' sessions and interviewed several representatives of various external organizations working in the criminal courts. In total, we identified and interviewed representatives of twenty-four separate entities participating in case disposition in the criminal courts, including those entities that exclusively worked in the drug court (see Table 1).

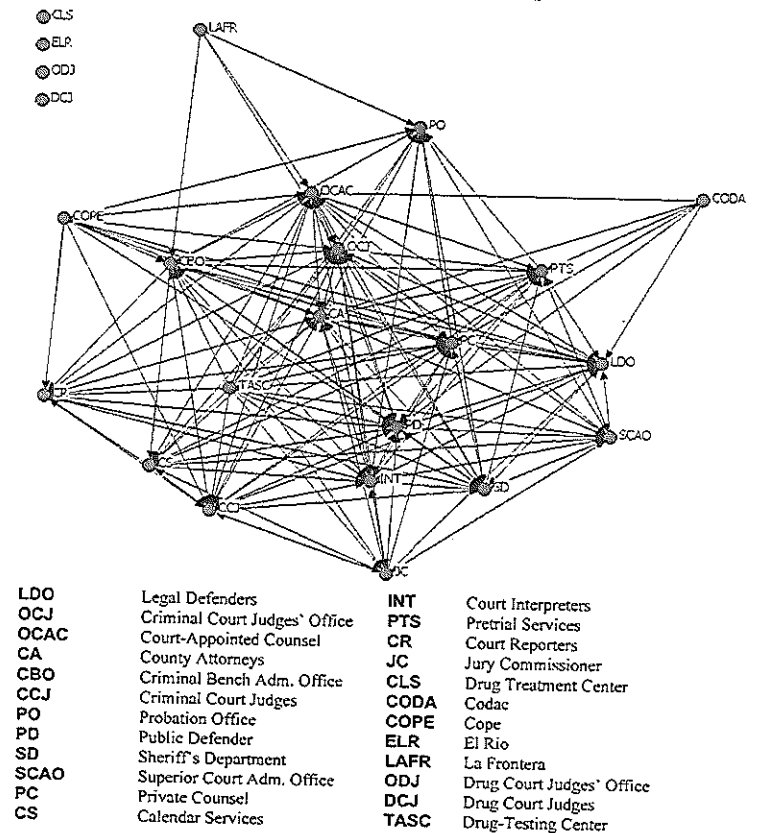
For every entity, we interviewed at least either the organizational head or a designated representative that worked at the superior court and had extensive or intimate knowledge of their organizational activities in the court. We talked with as many as fifty-seven individual actors working at the court. For some entities such as county attorney's office, public defender's office, and probation office, we interviewed as many as six representatives that worked at the court. But for our quantitative analysis, we used only the questionnaire completed by the organizational representative of these entities since our study focus was on organizational links. We used the information gathered from the interviewees for our qualitative analysis. Some of the questions asked during the qualitative phase included information on the operation of the courts; identification of various sponsoring organizations and representatives working in both the regular criminal courts and the specialized drug court; relationships interviewees and their organizations had with other organizations; and critical players working in either the criminal or drug courts.

Using the network-analysis questionnaire for the quantitative portion of our study, we were able to assess and validate the patterns discovered during the qualitative phase. Notably, the questionnaire was designed to elicit information about the characteristics as well as sociometric or network structure of the criminal courts. As shown in the sample questions excerpted in the Appendix, questionnaire respondents were asked to identify relationships that they had with individuals and organizations whose work affected their particular entity ("most critical" relationship links) during the immediate past three to six months, the nature of the relationships at various stages of case disposition (pretrial, trial, and post-conviction), the strength of the relationships, and other characteristics that provided insights into the nature of the relationships. The response rate for the quantitative portion of the study was 100 percent as all twenty-four entities completed the questionnaire. We then used Ucinet 6 for Windows for data manipulation and analysis (Borgatti, Everett, and Freeman, 2002).

Defense attorneys participating in case disposition in criminal courts of the Pima County Superior Court are sponsored by, and represented by, four different organizations. The four sources of defense attorneys are offices of the public defender, legal defenders, court-appointed counsel, and the private bar. In answering some questions related to the centrality of the defense counsel actors, we combined the questionnaire data collected from, and for, these four sources of defense attorneys as one set of

³ The data transferred to Ucinet were raw data we collected from each respondent and were not "confirmed" with entities selected by the respondents. For example, Organization A might indicate the existence of a linkage with Organization B while Organization B might not indicate the existence of a linkage with Organization A. Thus, our transferred data recorded a link identified by A even if B did not equally confirm the existence of a linkage with A. Since the linkage matrices we transferred from Excel represented unconfirmed relationships, we transformed the unconfirmed raw data to confirmed data in Ucinet.

Figure 1
Raw Organization Linkages in Pretrial Case Disposition Phase

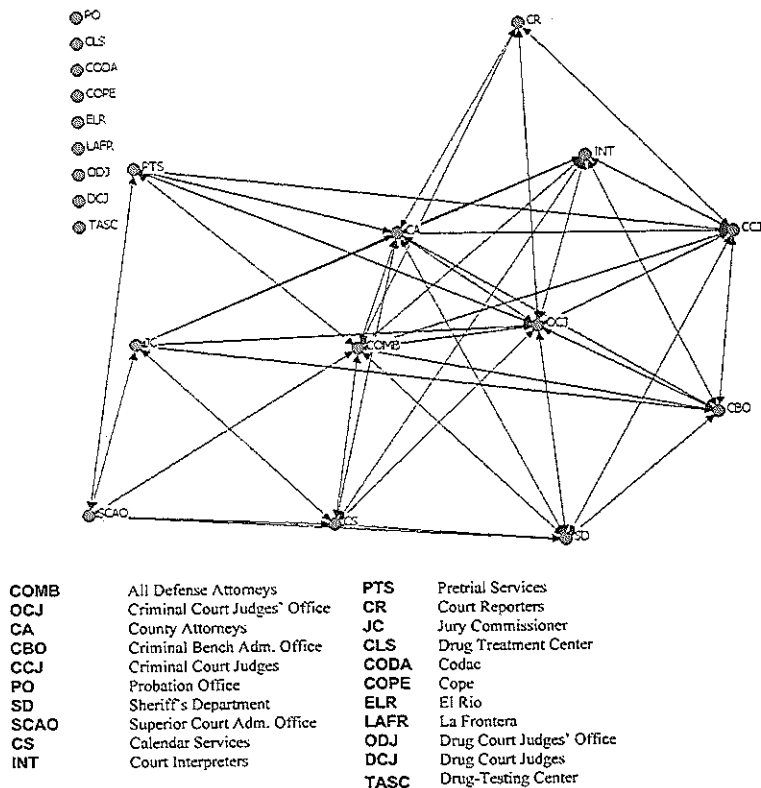


defense counsel. We combined the data so that we could assess the defense counsel as one distinct group of actors comparable to the judge and the prosecutors. In addition, we combined the data so that we could later compare the results obtained from treating each sponsored defense counsel separately with our results obtained from studying the four entities as one combined group of defense attorneys.³

Before generating network measures and further analyzing the data collected from the questionnaire, we reviewed the sociograms (generated by NetDraw) containing the combined defense counsel entity. In Figure 1, we show the diagram generated by Ucinet's NetDraw program for the pretrial phase of case disposition process before transforming the raw data and before combining the defense-counsel data.

In Figure 2, we show the diagram generated by Ucinet's NetDraw program for the pretrial phase of case disposition process after transforming the raw data and after combining the defense-counsel data.

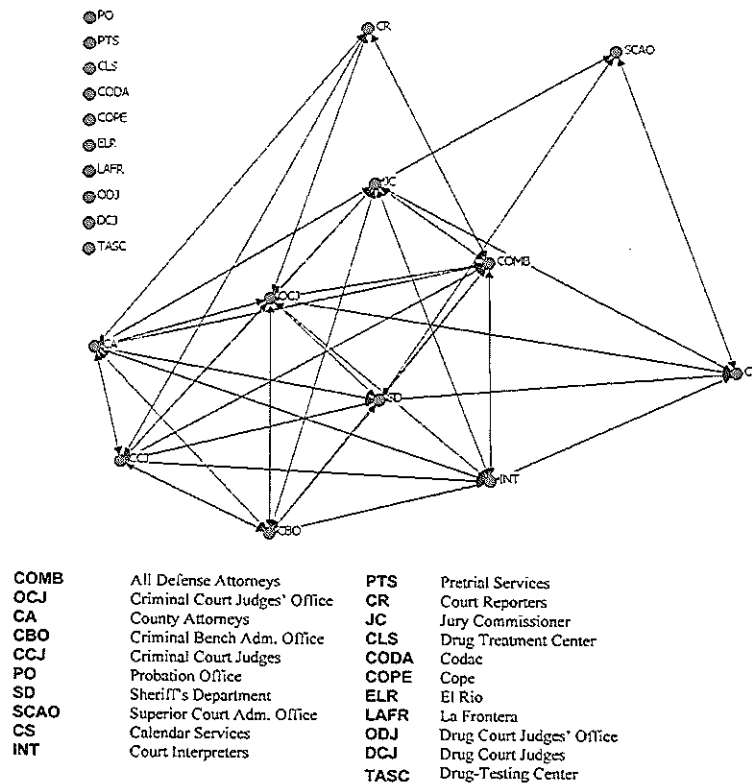
Figure 2
Confirmed Linkages with Combined Defense Counsel During Pretrial Case Disposition Phase



By examining the networks from figure to figure, we can see potential changes in the parties who are most important at each stage of the process and how the linkages among actors might change from stage to stage. For example, the combined defense-counsel entity ("COMB") appears to be one of the most central players at each phase of the criminal case disposition process (see Figures 2-4). We caution the reader here that more specific network measures of the data collected on the actors' relationships are needed to determine which actors are the most central. This is because, depending on the number of links and nodes, a sociogram might be too difficult to read, plus the measures provide more precise results of which actors are the most central.

One of the questions in our study was which of the participating entities was the most critical in the three major phases of a criminal court's case disposition process (i.e., pretrial, trial, and posttrial)? To answer this question, we relied on the degree-

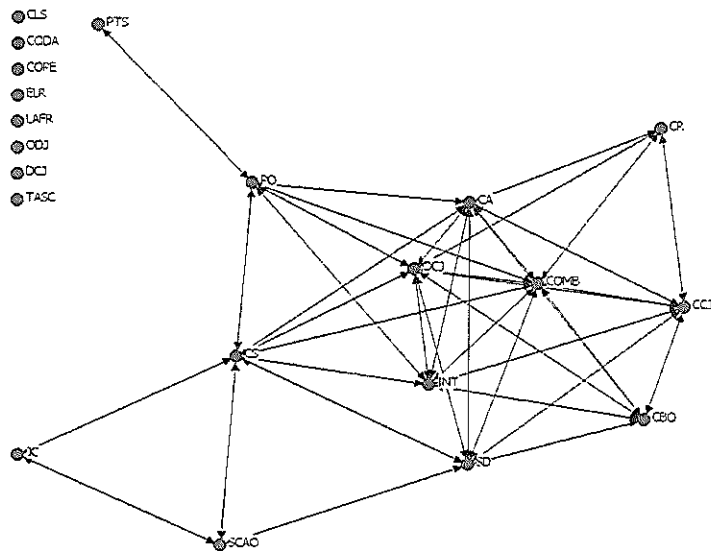
Figure 3
Confirmed Linkages with Combined Defense Counsel During Trial Case Disposition Phase



centrality measure (which identifies the number of direct links each organization has with other network actors) generated by Ucinet. The literature (e.g., Song, 2003) considers degree centrality⁴ a good measure of high visibility (Freeman, 1979) and direct access to alternative sources of information. Direct access is very much valued in the

⁴Two other common measures of centrality, which we considered using for determining the central actors in the case disposition process (Freeman, 1979), can be obtained from Ucinet. "Betweenness centrality" determines which actors serve as "gatekeepers" in a network, while "closeness centrality" identifies the extent a network actor can easily reach other network actors (Provan, Fish, and Sydow, 2007). We used degree centrality partly because identifying the gatekeeper was not the focus of our study. Separately, because we retained the network isolates for answering other questions, closeness centrality measures generated by Ucinet were less meaningful since the sociogram contains isolates (Provan, Fish, and Sydow, 2007). Notwithstanding, the betweenness-centrality and the closeness-centrality measures highly correlated with the degree-centrality measures.

Figure 4
Confirmed Linkages with Combined Defense Counsel During Posttrial Case Disposition Phase



- | | | | |
|-------------|-------------------------------|-------------|---------------------------|
| COMB | All Defense Attorneys | PTS | Pretrial Services |
| OCJ | Criminal Court Judges' Office | CR | Court Reporters |
| CA | County Attorneys | JC | Jury Commissioner |
| CBO | Criminal Bench Adm. Office | CLS | Drug Treatment Center |
| CCJ | Criminal Court Judges | CODA | Codac |
| PO | Probation Office | COPE | Cope |
| SD | Sheriff's Department | ELR | El Rio |
| SCAO | Superior Court Adm. Office | LAFR | La Frontera |
| CS | Calendar Services | ODJ | Drug Court Judges' Office |
| INT | Court Interpreters | DCJ | Drug Court Judges |
| | | TASC | Drug-Testing Center |

trial-court case disposition process because direct access enables an actor to achieve its intended goals, as many respondents explained to us during the qualitative portion of the study. Respondents also clarified that the achievement of intended goals is highly desirable and actors having direct access are regarded as being very critical or influential in the disposition process.

In Table 2, we present the degree-centrality scores (obtained from Ucinet for all the three disposition phases) after combining the data for the defense-attorney entities. Because of space limitation, only the pretrial degree-centrality scores are ranked

⁵ Some scholars (e.g., Hanneman and Riddle, 2005) have established that since degree centrality measures the number of direct links, the cutoff score for determining the most central network players will be the total of the mean and one standard deviation. Thus, any actor with a degree centrality above this cutoff degree-centrality score will be regarded as one of the most central players.

Table 2
Critical Players in Criminal Court Case Disposition Using Degree Centrality (Combined Defense-Attorney Entities)

	Pretrial	Trial	Posttrial
Criminal Court Judges' Office	10	9	9
County Attorneys	10	8	9
COMBINED Defense Attorneys	10	8	9
Criminal Court Judges	8	8	7
Sheriff's Department	7	7	7
Court Interpreters	7	7	7
Criminal Bench Administrative Office	7	7	6
Calendar Services	7	5	6
Jury Commissioner	6	8	8
Superior Court Administrator's Office	5	3	3
Pretrial Services	5	0	1
Court Reporters	4	4	4
Probation Office	0	0	6
Drug Treatment Center (CLS)	0	0	0
Codac	0	0	0
Cope	0	0	0
El Rio	0	0	0
La Frontera	0	0	0
Drug Court Judges' Office	0	0	0
Drug Court Judges	0	0	0
Drug-Testing Center (TASC)	0	0	0
MEAN	4.10	3.52	3.71
STANDARD DEVIATION	3.84	3.61	3.56
CUTOFF SCORE FOR MOST CENTRAL PLAYERS	7.94	7.13	7.27

in descending order in the table. Looking at the pretrial results, and using criteria established by some scholars for selecting the most central players⁵, the criminal court judges' office, county attorneys, combined defense attorneys, and criminal court judges (with degree-centrality cutoff scores above 7.94) were the most critical players during the pretrial phase. Expectedly, the combined defense attorneys became one of the most critical players during the pretrial phase.

Looking the trial phase in the table, five organizations—the criminal court judges' office, county attorneys, criminal court judges, jury commissioner, and the combined defense attorneys—turned out to be the most critical players since their degree centrality scores exceed 7.13, the cutoff score. As for the posttrial phase, four entities—the criminal court judges' office, county attorneys, calendar services, and the combined defense attorneys—emerged as the most critical players since their degree-centrality scores exceed 7.27, the cutoff score.

Separately, we found that the drug court (represented by the drug court judges and their offices), while part of the criminal bench, had very little connection to the criminal courts overall. The drug court was peripheral in all phases of the criminal

court disposition process (see Figures 1-4). More important, all the external entities actively participating in the drug court (which is part of the criminal bench)—Codac, Cope, El Rio, Frontera, the drug treatment center, and the drug-testing center—had little to no connection to the overall criminal bench in all stages of the disposition process. In the next section, we further discuss the results of our study and demonstrate how some of our findings shed further light on existing court literature.

DISCUSSION

The results in Table 2 confirm what the literature (e.g., Eisenstein and Jacob, 1977) tells us about the most critical players in the overall criminal-court case disposition process. They are likely to be the county attorneys, defense attorneys, and the judges. Again, the criminal court judges did not have the largest number of direct links, but they were very critical in the disposition process. During the pretrial stage, prosecution and defense, as expected, were critical in the disposition process because they were likely to heavily interact because of plea-bargain negotiations. But they remained critical in the other two phases of the disposition process.

However, other entities—the jury commissioner in the trial phase and calendar services in the posttrial phase—also emerged as part of the most-influential-players group, which is a departure from what the literature tells us. Of course, the jury commissioner would be expected to be critical during the trial phase given that jurors are very active at this stage. But calendar services emerging as a critical player during the posttrial phase was surprising since the entity would be expected to be more active during the pretrial stage. Regardless, we consider it a departure that both entities have high degree-centrality scores since the literature speaks to the overall case disposition process and not to different disposition phases.

To elaborate further, our results are important for a few important reasons. First, previous scholars like Eisenstein and Jacob (1977) and Eisenstein, Flemming, and Nardulli (1988) established that actors in criminal courtrooms work in common work groups. Eisenstein and Jacob (1977) theorized that key work-group members or the most critical players in criminal courts primarily consist of judges, prosecutors, and defense counsel. The authors acknowledged that criminal court work groups consist of other players such as bailiffs and court reporters but insisted that these actors play less significant roles. Likewise, Eisenstein, Flemming, and Nardulli (1988) argued that judges, prosecutors, and defense counsel are critical to case disposition in criminal court but recognized that other actors (both internal and external) might influence the criminal case disposition process. These authors also elaborated on the influence of sponsoring organizations providing key representatives to criminal courts.

However, these scholars studied trial court actors as a whole but did not get at the possibility that different actors may be more or less important at different stages of the entire case disposition process. Not clear from their findings was whether the core work-group members or the minor ones differ from one phase (pretrial, trial, and post-trial) of the criminal case disposition process to another. Using the various quantitative structural measures provided by network analysis, we discovered that most of the actors constituting the most influential players did not change from one phase to the other, regardless of which structural measure was used.

We found, as previous scholars did, that the core work-group players in the criminal-court case disposition process consisted of judges, prosecutors, and defense attorneys, irrespective of the disposition phase. We also discovered that other criminal

court players sometimes emerged as part of the core work groups in the disposition process. Although the most critical players did not significantly change from phase to phase, measuring them at different stages is important because it gives a more accurate picture of the entire criminal court network working to dispose cases at various stages. Therefore, we recommend that scholars should pay attention to different disposition phases because doing so enables them to assess whether actors thought to be core work-group members at one phase might turn out not to be.

Second, our results suggest that the defense counsel when diffused into many entities might not be very critical at any phase of the criminal-court case disposition process or to the overall process. This was slightly different from what the literature indicates about the centrality of defense attorneys (Eisenstein and Jacob, 1977; Eisenstein, Flemming, and Nardulli, 1988), but the literature does not distinguish the critical players across various phases of the criminal court disposition process. At the superior court, the defense attorneys were sponsored by four different entities—public defender's office, office of legal counsel, office of court-appointed counsel, and the private bar. In our study, we discovered that when the defense-counsel entities' network data were not combined, the defense counsel at each of the individual entities did not register at the top of the list of the most influential players in the criminal courtrooms. However, when we combined these entities together as "defense counsel," the combined entity retained top status among the most critical players in the criminal courtrooms, as the literature states, regardless of disposition phase.

Clearly, these results are a reflection of the diffusion of the defense counsel into several entities. This finding is unique in itself. The fragmentation of the defense counsel might preclude other actors in the courtrooms from developing closer relationships with defense attorneys. Hence, the initial results showed that courtroom actors did not perceive individual defense attorneys as being very central players in the case disposition process. Defense attorneys as a group are a significant part of court work groups. But defense attorneys come from multiple organizations, while the prosecution comes from one entity. By examining the entities sponsoring defense attorneys separately, the result might be that the prosecution may be more familiar overall to judges and to other court actors, as repeat players. This may even make prosecutors more powerful as some scholars suggest. Because defense attorneys can come from different sponsoring organizations, they may be less familiar to other court actors because there are fewer opportunities in medium-to-large courts to interact with other players in the justice system.

Third, our results indicate that resources allocated to less popular critical players, such as the jury commissioner or calendar services, at different phases of case disposition process might be insufficient since the literature does not recognize these players as very critical to the disposition process. Our results call attention to these players and might encourage court managers to revisit their allocation process to determine if these players indeed merit additional resources.

Separately, the drug court findings demonstrated its weak connection to the overall criminal bench that it is administratively a part of. This finding confirmed what the literature (Jacob, 1997) says about the connection of judges working in trial courts—trial court judges are loosely coupled with one another. Although this drug court is nominally part of the criminal bench, it is treated as an autonomous subentity by administrators both at the bench level and at the trial court level. Notably, the drug court was administratively managed by a coordinator who was a probation officer.

Because the drug court is not so strongly connected to the overall network and operations of the criminal court, court administrators and those in the traditional criminal system might not see the overall work and impact of the drug court on a day-to-day basis. The specialized techniques, operations, and therapeutic values of the drug court may also have less impact on the overall culture of the criminal bench because of the lack of interaction with criminal court actors in the traditional system. Some scholars and proponents of specialized courts have suggested that the implementation of specialized courts may ultimately "rub off" on the traditional criminal courts and make them more therapeutic in nature (see Rottman, 2000; Winick and Wexler, 2003).

Thus, for specialized courts to change judging or therapeutically alter criminal courts or the criminal bench, then the lack of connection to the criminal courts is unlikely to provide the kind of influence on traditional judging that some have hoped. A closer connection and closer integration beyond that of making specialized courts a subunit of a bench may be necessary for broader reform and even the kind of status that might attract attention and resources.

Furthermore, our results regarding the peripheral nature of the external organizations active in the drug court confirmed Malcolm Feeley's (1983) conclusion that court reform is very difficult to implement and institutionalize. Feeley noted in his treatise that courtroom actors themselves have a flawed understanding of how courts operate and tend to have unrealistic expectations of what courts can do. Thus, relying on Feeley's cautionary words, court actors implementing some of these innovative programs might have unrealistic expectations of the impact of these programs.

Therefore, what does this mean as far as institutionalizing drug or specialty courts, or incorporating new theories such as restorative justice and therapeutic jurisprudence (Winick and Wexler, 2003)? If drug or other specialty courts do not alter the structure of trial courts or interact much with them, will these specialized courts survive? Even if drug courts are strongly connected to external organizations such as treatment facilities, mental-health organizations, and other nonprofit agencies, our results suggest that these connections do not necessarily impact or touch the rest of the criminal bench.

Scholars such as Nardulli, Eisenstein, and Flemming (1988) and Flemming (1998) have argued that the environments outside trial courts must be considered while studying them. Implicit in their arguments is the importance of the impact of actors external to the courthouse community to trial courts' operations. In our study, the results indicate that external organizations operating in the drug court do not appear to have any influence on the Pima County Superior Court overall. Other results suggest that nontraditional criminal justice or external organizations were perceived as having significant influence on case disposition in the drug court, but the influence seemed limited to the drug court and not extended to the superior court.

While we have presented some of our significant results here, we plan to report the remaining results in forthcoming publications. We also note here that we did not study all aspects of the superior court's operations. For instance, the drug court in the criminal bench was undergoing some structural and organizational changes during the time of our study. We have yet to collect network performance measures after these changes.

As Kilduff and Tsai (2003) note, there might be correlations between network arrangements and outcomes achieved. For example, Provan and Sebastian (1998), in their study of mental-health agencies, found that the city with the lowest-density ties

among its agencies had the highest effectiveness, while the city with the highest-density agency ties had the lowest effectiveness. Furthermore, Mandell and Keast (2007) argue that collaborative networks, when compared to cooperative or coordinative networks on performance, require performance measures different from the measures used for the other two network types. With our research, if the performances of the entities working as part of the drug court network are measured on a cooperative basis, we would focus on each entity and use typical organizational effectiveness measures, such as the number of cases closed by some entities and the number of clients served by other entities. However, if we treat the entities as part of a collaborative network, we would focus on the entire drug court system and, for example, assess measurements such as time to dispose each client's case, time to cure each client, and the number of clients not completing different phases of the drug court program.

The illustration above helps demonstrate the utility of network analysis for understanding how trial courts function as organizations. We also note here that network analysis might also be used to improve the management effectiveness and efficiency of courts by finding more efficient linkages in a network.

CONCLUSION

Network analysis offers trial court scholars a method for understanding trial courts as organizations (Ostrom et al., 2007), how these organizations evolve over time, and the impact of trial court reforms on court actors. We have mentioned a host of possible studies that could be conducted on trial courts using network analysis. For example, assessing the linkages between actors inside and outside of courts could enlighten scholars on important horizontal and vertical linkages that are unknown to scholars and allow scholars to test the significance of linkages that are already known. In addition, network analysis could be used to compare and contrast different organizational models of courts. For example, the linkages and couplings in a unified trial court system versus a non-unified court system or the linkages among different types of courts around the world (e.g., common law, civil, Islamic, etc.).

The use of network analysis can also help scholars assess the impact of reforms and how they are implemented. For example, with network analysis, scholars might be able to explore the premises and assumptions of unification. Scholars might also be able to answer several questions pertaining to unification. Does unification really unify the administrative structure of courts? Administratively, what and how close are the linkages between state trial courts and state budget providers?

Separately, network analysis might enable scholars to fully examine the effect of localism on trial courts. Is localism as prominent as unification reformers thought? Furthermore, what are the linkages and couplings in a typical courtroom without unification? Do they support findings of previous studies? In addition, the application of network analysis might open other gates of inquiry and offer scholars opportunities to study aspects of trial court operations that influence many structures of courts but which have not been identified as possible sources of study by scholars.

Finally, as to reforms, network analysis can be used to examine the change in networks before and after a reform takes place. For instance, how does the incorporation of a specialty court impact the court as a whole? How might other policy changes that link courts to the community expand the networks of trial courts? jsj

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