Boundary Spanners and Community-University Engagement Networks:
A Mixed Methods Ethnographic Study
by

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Abstract

Modern conceptions of land grant institutions have shifted focus from community outreach to community engagement, with focus on more egalitarian partnerships that place community members in active response to university engagement efforts. Historical studies that explore these interactions often fail to capture the nuance and reciprocity of these collaborations, thus minimizing the autonomy and contribution of the community. This study synthesizes theories of social network analysis, collaborative complex adaptive networks, and boundary spanners to frame the collaborations between university and community as *community-university engagement networks (CUEN).* Social network analysis is used to explore two research questions specific to a community-university partnership (O Grows) between Auburn University and the city of Opelika in Lee County, Alabama to demonstrate the collaborative structures of the resulting CUEN. Results of this study demonstrate the network structure of four boundary spanners (community-based problem solver, technical expert, internal engagement advocate, engagement champions) as well as measures of the CUEN growth and change in the partnership from 2012 to 2017.

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CAN	Complex Adaptive Network
CUEN	Community-University Engagement Networks
LAN	Learning Action Network
OGCUEN	O Grows Community-University Engagement Network

Chapter One: The Community Perspective of Land Grant Institutions

In 2016, the *Wall Street Journal* published an article on national economic outliers that possessed unique factors that propelled them to thrive despite a decrease in manufacturing employment. One such outlier was a county in eastern Alabama, home to Auburn University, with an unemployment rate of 4.7%, just below the national average. Lee County was one of 16 regions identified by the Brookings Institution as having outlier characteristics, including a resilient economy and robust job growth, attributes inconsistent with national trends in similar regions with reduced manufacturing positions. Notably, several of the outlier regions in this study with a decrease in manufacturing jobs but consistently low unemployment rates are home to major universities that maintain connections with surrounding communities (Davis, p. 1). The concentration of highly educated citizens affects these rates, but other community factors bolster the resilience identified in areas with engaged universities, such as state extension staff collaborating with agricultural professionals through community-university partnerships to create enticing proposals that attract new businesses to the area.

Perhaps outlier communities that include universities are resilient because of the collaborative space established between community and university partners, where university professionals and community members reach out to one another to foster resource exchanges and address community problems. In Lee County, home to Auburn University and the city of Opelika, one such collaboration was founded on gardens, food, education, history, and community. The small project, O Grows, is a network of community and university actors who share a collective vision that outdoor spaces in a community are essential and should be cared for and utilized for its benefit. With roots in local schools, O Grows began as a response to community requests for help creating beautiful, functional areas around the city. As the engagement process developed, O Grows used

a model of intentional adaptation to focus on evolving community needs, which grew to include food security and local food systems. To create and maintain reciprocal ties with community partners, the O Grows model eschews simple, measurable outcomes and instead finds value in the *process*: the practice of community engagement through reciprocal exchange and collaboration.

Background

Beginning in 1914, the espoused value of land grant institutions was to connect with communities to provide access to education and resources through engaging activities that reflected local needs and interests (Franz, 2014). The shift to a modern conception of these outreach models has pushed institutions to create authentic participatory frames of collaboration with communities (Applebee, 2000). To foster this community-university engagement, universities must collaborate with community members in a shared negotiation space that pushes the boundaries of what Lewis Gordon (2006) refers to as the "disciplinary decadence" of existing scholarship. Rather than languishing in the academic value derived from university-led outreach programs, this new conception of community engagement requires space for transformative collaboration and operates on the supposition that communities hold significant value beyond serving as a laboratory for learning and research.

Community engagement requires faculty to engage as practitioners who "position universities as democratic purveyors who should have as their mission to contribute to our nation's most pressing social, economic, and civic problems through a rethinking of the university's social responsibility with its neighboring communities" (Hopson et al., 2016, p. 34). In this democratic notion of a university's role in the community, university professionals possess the capacity to broker connections between the community and university, directing university resources while remaining open and responsive to community-led ideas.

Community engagement in higher education has evolved since the initial institutional adoption of outreach models; where faculty initially focused on an outward-facing approach to community work, the aim now reflects reciprocity between community and university in the engagement process (Franz, 2009, 2014). This shift has resulted from the iterative restructuring of community engagement models and channels of theoretical discussion to reveal the inherent assumptions driving this practice, including recognizing the autonomy held by community participants in the collaborative process (Anderson et al., 2019). One recent study demonstrates the ability to examine community engagement through a network theory lens, using network analysis to map the development of a project through relational characteristics among community and university actors (Woolcott & Chamberlain, 2019).

This research study is a retrospective examination (Venturini et al., 2021; Woolcott & Chamberlain, 2019) of the boundary-spanning roles (Weerts & Sandmann, 2010) in a community-university engagement network as demonstrated through visualizations of spatialized relational compositions (Contandriopoulos et al., 2018; Decuypere, 2020; Venturini et al., 2021). The idea for this study evolved out of careful observation and the investigation of a particular partnership between Auburn University and the community of Opelika: O Grows. Through a synthesis of network analysis and community engagement, this study demonstrates how university boundary spanners build projects with community actors who are "subject matter experts with the ability to influence change" (Bright et al., 2017, p. 337) in the partnership. Bridging this practical investigation gap necessitates a discussion of how social capital and network theories apply to community engagement and how scholars have examined these constructs in the relevant literature.

DePrince and DiEnno (2019) describe the modern conception of community engagement as "a method of research, creative work, teaching, and learning that emphasizes university-community partnerships characterized by mutual benefit and reciprocity" (p. 24). Focus on mutual reciprocity aligns with the Carnegie Foundation definition of community engagement as "the collaboration between institutions of higher education and their larger communities (local, regional/state, national, global) for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity" (Driscoll, 2008, p. 39). These descriptions move community engagement beyond the basic diffusion of knowledge and shift focus to the democratic characteristics of reciprocity infused in the collaborative process. The institutional value and complexity of community engagement are demonstrated through the variety of systems created to foster community partnerships and transfer the work to scholarly publications and presentations (Franz, 2014; Key et al., 2019; Sandmann et al., 2016) as well as strategies to bolster connected systems that support community engagement within an institution (Kania & Kramer, 2011; Mtawa et al., 2016; Weerts & Sandmann, 2010).

Foundational to the community engagement process is the role of social capital among community and university stakeholders as they negotiate resources and benefits for their distinct and shared interests. Less prevalent in community engagement discussions is the examination of the ties created and maintained among boundary-spanning actors that preserve the systems within which the community engagement process unfolds. The community psychology and community development literature have established the role of social capital in the multifaceted dynamics of community-based research, and this lens of exploration also applies to the community engagement process (Balfour & Alter, 2016; Provan et al., 2005; Woolcott & Chamberlain, 2019). Within these studies, social capital refers to the mutual engagement and norms in networks through cooperative

action as the foundation for collaboration and collective action. It is assumed to be present both within and between social structures at the "interpersonal, community, institutional, or societal levels in terms of both bridging and bonding social connections" (Perkins et al., 2002, p. 34). In an examination of community social capital, Perkins et al. (2002) speak to the value of both bonding and bridging actions, where the latter offers "opportunities to increase power, access, and learning" (p. 33) as part of a healthy community environment.

Why focus on boundary-spanning behavior?

Conceptions of relational ties as social capital are widely used and broadly applied across disciplines, with definitions that vary according to use. However, Coleman (1988) has established the definitional element that "social capital inheres in the structure of relations between actors or among actors. It is not lodged either in the actors themselves or the physical implements of production" (p. S98). This definition speaks to the functional role of relationships as conduits of social capital in networks, whether examined at the individual or organizational level (Perkins et al., 2002). In communities, relationships develop through the ties established in repeated face-to-face interactions, leading to social networks and social capital development, where network brokers address barriers and facilitate community processes through contributions to collaborations with network actors (Balfour & Alter, 2016). To understand the complexity of these relationships, network analysis exists as a tool to synthesize and spatialize the "formation and existence of relationships" (Bright et al., 2017, p. 338) as perpetuated by university actors who engage with community members.

In relational applications, boundary spanners exist as a bridge between an organization and outside partnerships (Scott, 1991), with the primary purpose being to process information from the environment and provide external representation to stakeholders outside the organization (Aldrich

& Herker, 1977). Researchers have applied network theories and boundary-spanner constructs to community engagement studies; specifically, Stephenson (2011) and Weerts and Sandmann (2010) adopt network theories as lenses through which to examine the nature of faculty involvement with community members. In one discussion of social capital in the community, Perkins et al. (2002) identify the value of examining how individuals use bridging capital opportunities "that increase power, access, and learning" (p. 35). Within this study, the authors also articulate the need for a broad representation of organizations and institutions to perpetuate ties that bolster boundary-spanning behavior, social capital, and interdependence in the community network.

Within a network theory perspective of community engagement, boundary spanning is a necessary behavior of university actors who seek partnerships with community members, as indicated across studies of how communities and universities navigate the divide between their groups to collaborate (Bringle & Hatcher, 2000; Holland, 2005; Maurrasse, 2001). Moreover, studies have identified the results of these collaborations, where "relational dynamics in a partnership can influence the parity of the partnership which can, in turn, affect the outcomes and success of the partnership" (Anderson et al., 2019, p. 13), further evidence of how network ties impact community engagement. Though many researchers argue that ties exist throughout whole organizations or institutions, Weerts and Sandmann (2010) focus on the individuals who broker relationships to consider the ties created by actor-level interactions within these groups (Perkins et al., 2002). Similarly, a focus on the boundary-spanning behavior exhibited by faculty during community engagement allows for the identification of the individual ties that perpetuate a reciprocal exchange as it unfolds during community-university collaborations. Finally, mapping these ties reveals the resulting network of ties among actors, and it is possible to visualize the

nature of Carnegie's "mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity" (Driscoll, 2008, p. 39) as it occurs during the process.

Statement of the Problem

At the intersection where academic institutions and communities collaborate, there exists a space where the community engagement process unfolds; it is a context-specific process with distinct features across unique partnerships and must be understood. To create a framework to understand these partnerships, Anderson et al. (2019) worked with community engagement professionals, finding a clear disconnect between the need for transferrable evaluation frameworks that might foster broad discussion and the loss of specificity that makes individual examples especially relevant. Efforts to unify research and scholarship on community engagement necessitate studies that provide accessible information about unique partnerships with methods that demonstrate relevance to individual readers while maintaining an institutional context narrative. Recent studies focus on community engagement as a process of "partnerships characterized by mutual benefit and reciprocity" (DePrince & DiEnno, 2019, p. 24) and a "mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity" (Driscoll, 2008, p. 39). Consequently, it is clear why the authors note difficulties in framing and discussing the faculty engagement process (Giles, 2008; O'Meara et al., 2011; Sandmann, 2008; Ward, 2003) in such a way that would allow conversations across institutions and partnerships.

Multiple studies have identified the importance of network perspectives to understand and create responsive community engagement processes with ties between boundary spanners and community actors (Anderson et al., 2019; Balfour & Alter, 2016; Provan et al., 2005; Woolcott & Chamberlain, 2019). Despite the cultivation of a new model for community engagement focused

on reciprocity, there remains a paucity of research examining the community engagement process that unfolds among actors as they navigate shared interests in a collective space. Moreover, researchers have discovered that actors who participate in community engagement often do not have specific responsibilities or job descriptions pertaining to the process and, therefore, might not be identified as instrumental (Van Schyndel et al., 2019), making it more difficult to find and study those who support such partnerships. Thus, studies of these collaborations continue to find significant gaps in how universities value and promote community engagement at the faculty level, including a lack of academic recognition and available resources for participating faculty (Anderson et al., 2019).

Though recent research builds on the boundary-spanner roles created by Weerts and Sandmann (2010) to expand the conceptualization of leadership (Van Schyndel et al., 2019), no investigation has emerged that visualizes the process that unfolds among university and community actors during community engagement. If community engagement research is to explore partnership processes that are responsive, adaptive, and egalitarian, researchers must utilize relational tools with the capacity to capture each unique process as it exists in context.

Purpose

To answer the call for a pragmatic exploration of community engagement based on modern conceptions, this study will examine the theories that support a relational perspective of community engagement and apply network analysis tools to demonstrate the work of boundary spanners in the collaborative process. The integration of network theory and boundary-spanning behavior establishes a framework to examine university actors and the network process of engagement as it evolves between an institution of higher education and the community.

Study Questions

Research questions for this study focus on the relevant perspectives on social capital, community, network theory, and boundary-spanning behavior to explore the relational composition of community engagement through narrative and numerical data. Therefore, the initial integration of these constructs will uncover the community-university engagement network created by boundary-spanner roles (Weerts & Sandmann, 2010). The second research question is essential to any examination of community engagement because the emergent nature of the collaborative process creates unpredictability in the network structure, where instability allows for unique characteristics that change over time (Woolcott & Chamberlain, 2019).

Research Question One: *How do boundary spanners create a community-university engagement network?*

Research Question Two: *How does boundary-spanning behavior affect a community-university engagement network over time?*

Addressing the Questions

This exploratory investigation offers insights into the community engagement process not readily available through standard measures (Woolcott & Chamberlain, 2019) and maps relational compositions to explore boundary-spanning relationships in a community-university engagement network through spatialization and network analysis (Borgatti et al., 2009; Venturini et al., 2021). A more elaborate description appears in subsequent chapters, but I will include here a basic overview of the process through which I explored these questions. First, I conducted an exhaustive literature review of theoretical and practical applications across disciplines to understand the network perspective. Throughout this process, I iteratively synthesized ideas from studies on social

capital, community development, network theory, and community engagement to develop a comprehensive network perspective of the community engagement process.

Xu and Storr (2012) assert that qualitative research assumes that evidence exists in a dynamic reality with nuances and complexities that forge a path by which a qualitative researcher is central to the data generation and interpretation process. I began this study with the belief that community engagement is a unique, context-specific process; to create internal consistency, my research design necessitated a responsive toolkit. Thus, I acted as the central instrument for this study and utilized the literature review process to inform all research design decisions. If I were to illustrate my research path during this study, the picture would resemble an old, sturdy oak tree with various branches representing specific aspects of the study. Within the wide, sturdy trunk were the established community-university partnerships and theories found in the literature that framed my understanding of these collaborations. To discover new perspectives through the ethnographic process, I traversed the asymmetrical branches that sprung from the well-established trunk. As the process unfolded, I would follow a branch path and then return to the trunk for stability and orientation to make sense of what I learned and synthesize it with existing study details. Maintaining a clear framework within which to handle the multitude of data points reinforced my role as the primary instrument whereby I could manage the "chaos and confusion" (Patton, 2002, p. 432) of the qualitative data. As a result, I could identify patterns and draw interpretations that would fit with the literature theories and create meaning for a broader audience (Marshall, 2002; Patton, 2002).

As a Ph.D. candidate, I worked as a graduate teaching assistant and volunteered extensively with the O Grows community partnership; these roles provided continuous opportunities to engage with university and community actors, observe interactions, and make sense of the network of

relationships that facilitate the unique community engagement process. To generate and transform data, I used an ethnographic process with narrative and numerical data processing (Decuypere, 2020; Venturini et al., 2021) to make sense of how university and community actors accessed and utilized social capital to create a collective response to local needs. Further, a network analysis allowed me to identify the characteristics of the community-university engagement network created by boundary spanners. Studies and scholarship on network theory, community engagement, social capital, and boundary spanners informed the conceptualization of the research questions. My ongoing immersion in this project fostered an intrinsic awareness of the complexity inherent to community engagement and necessitated an iterative, exploratory research design (Venturini et al., 2021; Woolcott & Chamberlain, 2019). Within this design, I used a concurrent parallel process to generate and transform the data collected through ethnographic observation and interviews (Decuypere, 2020) as well as convert it to relational data ready for organization and spatialization through network analysis (Borgatti et al., 2013); concurrent with each of these steps, I made interpretations that responded to theories found within my literature framework.

Study Implications

This study demonstrates the practical applications of network analysis as part of an exploratory study to identify the context of community engagement, creating a flexible space to explore the process of reciprocal exchange and collaboration between community and university actors. Specifically, mapping the relational composition of boundary-spanner roles in community engagement demonstrates the utility of network analysis to create an adaptive network that illustrates how university boundary spanners build responsive, egalitarian ties with the community. Moreover, spatializing the relational ties formed among individual actors identifies the democratic space in which community members appear beside faculty boundary spanners as active

participants in Carnegie's modern conception of the community engagement process. Finally, this novel perspective of community-university engagement networks is transdisciplinary, employs several research methods (O'Meara et al., 2011), and offers an alternative perspective to those based on traditional power structures of institutional inquiry (Saltmarsh, Harley, & Clayton, 2009; Sullivan, 2000).

Outline of the Dissertation

In Chapter Two, I present an overview of the literature used to inform this study, including descriptions of community constructs, the foundations of community engagement, and the role of social capital in networks. I synthesize these concepts with existing network perspectives of community engagement and use them to describe a new construct: community-university engagement networks. Chapter Three outlines the paradigmatic context of this study and the methodological application of established theories, and Chapter Four presents the relational compositions of boundary-spanner roles and network changes over time, including narrative data that describes the composition of each network. Finally, Chapter Five discusses the results and the broader implications of this exploratory study of relational ties in a community-university engagement network.

Chapter Two: The Network Space of Community Engagement

The literature reviewed in this chapter presents an overview of the most relevant perspectives utilized to frame this research study. The primary goal was to synthesize the theoretical constructs that support this mixed-methods study of university actors in a community engagement network. Bringing together myriad disciplinary constructs required an extensive examination of applied theories, independent of and relative to their role in community engagement. Despite the breadth of scholarship on community engagement, few studies investigate the dynamic, collaborative partnerships that no doubt exist across institutions of higher learning. However, the scholarship on community engagement demonstrates the complexity of the construct itself, where partnerships evolve within and across programs, departments, disciplines, colleges, faculty, citizens, neighborhoods, regions, states, and institutions. Therefore, the process of how faculty engage with communities eludes categorization (Giles, 2008; O'Meara et al., 2011; Sandmann, 2008; Ward, 2003) and elicits a need for "studies, frameworks, and methods that weave together an examination of different sectors of faculty work, theories from multiple areas in social science and other areas of inquiry, and a diverse set of research methods" (O'Meara et al., 2011, p. 85).

To create a path of inquiry and understanding across the disciplinary perspectives on community engagement constructs, I adopted the pragmatic *complementary whole* of Johnson and Onwuegbuzie (2004) to maintain and endorse a complex reality focused on democratic perspectives. A review of the literature begins with an overview of community engagement and then moves to the emergent, dynamic characteristics of this construct and the presence of social capital in the community. The focus then shifts to the relational perspective inherent in community engagement, including the role of actors in engagement networks, a discussion of university boundary spanners who create relational ties with community members, and an overview of social

capital in networks. Finally, I synthesize these ideas to create a novel phrase to represent the composite structure of the ties between university boundary spanners and community actors: the community-university engagement network.

Community Engagement

Across the United States, the federal government charged land grant institutions with missions of community outreach and a focus on issues facing citizens in their region; thus, university staff members were charged with living and working in the communities they supported to match identified issues with extension roles (Franz, 2014; Franz & Townson, 2008). The initial idea of outreach assumed that institutions, as centers of education, should seek to improve the lives of individuals in their communities by imparting relevant knowledge through educational programming.

This unidirectional notion of outreach has shifted over time to accommodate more democratic perspectives, and the meaning of engagement has evolved to include a bidirectional information flow, with space for communities to participate in mutual co-learning environments where knowledge and resource exchanges arise from relationships that are heavily context-specific (Applebee, 2000; Franz, 2009; Peters & Franz, 2012). As the practice of community engagement continues to evolve, land grant institutions are perpetually shifting away from a unidirectional outreach effort to a more collaborative process in which communities and universities both share resources and knowledge (Franz, 2009; Franz, 2014; Peters & Franz, 2012), working to identify and articulate the espoused value of modern community engagement (Franz, 2014). As part of this process, researchers and practitioners perpetually push the academic discourse to foster depth and breadth in studies of how community engagement is examined, understood, and valued.

Within this paradigm shift from community outreach to community engagement, a change occurred at the individual level; to represent a partnership, the relationships formed among university and community actors necessitated collaboration and bidirectional exchanges. Ongoing evidence of this value shift is pervasive in the more robust description of partnerships, expanded measures of public value, and the role of public relations in enhancing images and stories shared with stakeholders and media (Franz, 2013, 2014; Kalambokidis, 2011). Extension faculty reveal the internal indicators of this value shift in their call for measures that demonstrate how their partnerships directly influence the community, including indices to measure changes in conditions, populations served, measurable impact across programs, behavioral indicators, and evidence of learning (Franz, 2012).

Institutional norms of community engagement

Despite the espoused shift to a modern, democratic paradigm of collaboration, the distinct indices of community engagement remain embedded in a positivist culture of implementation and impact, relying on indicators of success defined by institutional norms. In their 2009 white paper, Saltmarsh, Harley, & Clayton describe this embedded positivist culture as a reflection of the power dynamics driven by experts who push an agenda, and institutional expectations define *partnerships* as something that happens *to* the community rather than something that happens *with* the community. The authors specify that engagement frameworks rely on an "institutional epistemology that privileges the expertise in the university" (p. 7) as it is applied to external partners, and cite Sullivan (2000) as saying, "this epistemology is firmly entrenched as the operating system of much of the American university" (p. 29); thus these perspectives conflict with interactions centered on an egalitarian collaboration between the university and the community. This limited perspective becomes more entrenched in academia through studies that

conform to traditional expectations, perpetuated by a methodological gap that fails to capture the complex collaborative process of community engagement between faculty and community actors (Giles, 2008; O'Meara et al., 2011; Sandmann, 2008; Ward, 2003).

Despite this scholarly limitation, the value of community engagement remains evident in the institutional systems created to bolster such partnerships, including university-based campus centers, publications, conferences, and administrative positions to maintain and enhance community partnerships (Franz, 2014; Key et al., 2019; Sandmann et al., 2016). Universities persist in their commitment to partnering with communities, and perpetual efforts focused on collective, connected systems as they are supported within an institution (Kania & Kramer, 2011; Mtawa et al., 2016; Weerts & Sandmann, 2010) bolster the proposition that even with inconsistent application across institutions, community engagement matters. Moreover, the agility required to sustain and understand how each institution participates in community engagement is an additional indicator of its resistance to research and the lack of a shared language across institutions.

Theoretical Perspectives

There is no consistent scholarly overlap in the community engagement literature regarding the operationalization or investigation of the community engagement process, likely due to the emergent and collaborative process that is unique to each partnership (Anderson et al., 2019; Balfour & Alter, 2016; Giles, 2008; Woolcott & Chamberlain, 2019). To understand this elusive characterization and identify the foundational theories upon which the community engagement literature is predicated, part of this literature review includes an ontological investigation of the word *community* as used in the relevant scholarship. This section includes studies focused on some underlying assumptions about the concept of community that rely on the context-specific characteristics of a space occupied by multiple actors with varying degrees of social capital.

The community as an interactional field

The cohesive application of community engagement may remain elusive because the word *community* defies generalization in the literature; Paveglio et al. (2017) grapple with the theoretical underpinnings of its meaning, where historical precedent holds that the emergent and context-laden nature of the term resists consistent operationalization. Bridger et al. (2011) articulate the irrevocable messiness of communities as a human construct and assert that they exist as dynamic, complex interactional processes that exist beyond stable, predictable structures. Specifically, factors that instigate, influence, facilitate, and impact what constitutes community in a given scenario do not hold constant across "*geographical and temporal scales*" (Paveglio et al., 2017). When faced with an empirical examination of the term community, Paveglio et al. (2017) note broad discrepancies in how authors have defined it across studies, proposing that the lack of construct alignment is not because one is more accurate than another. Instead, the wide range of definitions demonstrates the inherent complexity of what has constituted a community across space and time. To account for a definitional range of the word community, Paveglio et al. (2017) speak to the emergent characteristics of the word and apply the work of Wilkinson (1991), Luloff and Bridger (2003), and Theodori and Kyle (2013) to conceptualize it as an interactional field that is

> best understood as a *process* that is 1. Created by diverse social actors who interact frequently to solve common local problems, 2. Tied to a particular locale for which local people have shared meanings, and 3. Defined by social networks and interpersonal relationships that are valued by participants. (p. 938)

Within this interactional field, a relational perspective informs the network perspective utilized in this study to explore community engagement.

Social capital in community engagement

Social capital is an embedded component of the relational network perspective. Though this study does not employ it as a measurement, it is included here because of its role as a foundational assumption that drives relationships and impacts how actors engage in a network. While operationalization may vary depending on its application, the basic assumptions of social capital remain the same: ties exist between individuals that, on some level, allow agency to be exerted between actors (Decuypere, 2020) and perpetuate network function. The role of social capital in relational ties is especially relevant to community engagement, where individual actors foster partnerships between communities and universities. Social capital must be understood as embedded in a structure—or context—because it only exists *between* actors; as Lin (1999) notes, it comprises "resources embedded in a social structure which are accessed and/or mobilized in purposive actions" (p. 35). When paired with the Carnegie Foundation's definition of community engagement as "the exchange of knowledge and resources in a context of partnership and reciprocity" (Driscoll, 2008, p. 39), the relational lens of social capital is a reasonable perspective to apply when studying community engagement.

Network Perspectives on Community Engagement

Though discussions of the term community include explicit discussions of the dynamic, process-based network characteristics of the construct, certain assumptions are not readily apparent across the community engagement scholarship. However, two studies offer network perspectives that frame this study; the first is an article (Stephenson, 2011) that explores the faculty engagement process as creating a *collaborative complex adaptive network*. The second study adopts a network perspective of community engagement by identifying university actors as

boundary spanners who reach outside their institutions to collaborate with community members (Weerts & Sandmann, 2010).

Stephenson (2011) identifies the network characteristics of the space occupied by a university and community during collaboration and explores different relational concepts that support the theoretical foundations of faculty engagement, concluding that the engagement process results in the creation of a collaborative complex adaptive network. Stephenson's examination includes the observations of Clarke and Roome (1995) about learning action networks (LANs), where ascribed characteristics occur due to true partnerships between a university and the community. In contrast, the work of Booher (2008) describes a complex adaptive network (CAN) that focuses on the nature of the relationships or ties created when specific patterns emerge during collaborative community-university efforts.

Descriptions of a LAN (Clark & Roome, 1995) resemble those of other networks discussed across the literature, where the defining feature is connections that complement existing formal organizational structures by linking individuals through the flow of information and ideas. Additionally, descriptions of a LAN point to a network embedded in complex organizational and social ties and the social context of a business, including management structures and processes that allow the network to facilitate novel knowledge creation systems and bolster cooperative action (Stephenson, 2011). Identifiable characteristics of LANs include organizational and intersectoral linkages, frequent interactions, norms of mutuality and trust, connections among stakeholders, negotiation of differences and conflicts, and bridges of understanding among otherwise uninformed groups in the community. Finally, a LAN will have disparate and connected nodes that bolster reciprocity and resemble organizational and social networks with pathways that enhance capacity, growth, and vitality (Roome & Clarke, 2002; Stephenson, 2011).

Similarly, Booher's (2008) notion of a CAN includes open systems comprised of nonlinear, dynamic actors with novel patterns of ties that foster processes within the network. This definition includes dynamic, responsive systems of community engagement such as forums, discussions, interactive processes, and the inclusion of diverse perspectives. Consequently, there are varied opportunities for discourse regarding ideas, goals, and the implications of collectively held community values and beliefs as integral components of the dynamic processes that exist in the network. Booher specifically examines the role of leaders in the network, especially facilitators who focus on institutional processes and navigate the inherent power differential between universities and communities. To tackle this discrepancy, Booher rejects a single-solution approach and encourages leaders to find and engage community voices through opportunities to discuss goals, plans, values, and beliefs that will result in a network of community ties. Booher's premise leads to a description of the engagement process that results in a relational composition similar to the interactional field of a community:

> Complex adaptive networks are networks of agents that interact dynamically and nonlinearly in an open system so as to generate novelty and emergent adaptive patterns. These patterns create a tension that maintains the system between falling into stasis and spinning off into chaos. (Paveglio et al., 2017, p. 113)

Stephenson's synthesis of learning activities and CANs presents an opportunity to reimagine the engagement process as an active, dynamic system of patterns created by collaborative partners at the community and university levels. It offers observational characteristics of the process Driscoll (2008, p. 39) describes as a "context of partnership and reciprocity" that results in a collaborative complex adaptive network.

Though the use of the terms *community* and *university* evokes a vision of collective groups engaged in some level of interaction, the community engagement paradigm results from active interactions among actors that lead to connections. Put differently, communities and universities include actors who participate in a deliberative process of emergent interactions that facilitate the collaborations observed at the organizational level. Previous studies have identified the activities of university actors who establish these partnerships and drive the creation of networks (Stephenson, 2011; Weerts & Sandmann, 2010), and researchers use network theory to examine the context of partnerships in which communities and universities engage (Balfour & Alter, 2016; Bright et al., 2017; Provan et al., 2005; Woolcott & Chamberlain, 2019; Ylikoski & Kivela, 2017). Within each of these studies, there is an inherent assumption that it is necessary to define the myriad dynamic social practices where individuals interact on behalf of their organizations to form relationships and foster community engagement (Provan et al., 2005). However, a sufficient examination of community engagement has not yet resulted from the use of traditional research methods (O'Meara et al., 2011).

Boundary spanners in community engagement

Within a similar community engagement perspective predicated on the presence of networks, the notion of boundary-crossing as a critical skill in organizations has been widely discussed and explored across disciplines (Ryser, 2019). While Stephenson's research frames the role of a community-university engagement network as an entity in which collaboration happens, other researchers focus on the role of individuals in establishing and sustaining such intra-organizational networks. Specifically, these studies investigate the role held by actors who cross institutional and community boundaries to establish partnerships outside their institutional networks.

Some studies center solely on individuals who step outside the centralized university system to foster community partnerships, discussing their experiences and individual motivations and characteristics. This context-specific process was named *boundary spanning* by Friedman and Podolny (1992) and describes a multi-dimensional construct that holds myriad purposes across levels and roles; Scott (1991) identifies boundary spanners as the bridge between an organization and partners. While examining boundary-spanning roles at various institutions, Weerts and Sandmann (2010) unpack the inherent complexity of this construct due to the nature of connections, the role an individual holds, their alignment with a given organization, and the social factors of engagement. These concepts are thoroughly described and examined in the qualitative study conducted in 2010 by Weerts and Sandmann. The authors investigate the behavior of university professionals participating in community engagement, delineating four prominent boundary-spanner roles: community-based problem solver, technical expert, internal engagement advocate, and engagement champion.

Community-based problem solvers have a "social closeness to the community and a task orientation that is largely technical and problem based" (Weerts & Sandmann, 2010, p. 642) and are frequently the closest to community engagement through partnership development, identifying and solving problems, and resource identification and acquisition. Moreover, these actors demonstrate the skills required to act as facilitators of reciprocal dialogue around issues of critical importance to the community, often resulting in meaningful exchanges and access to university advocates who use their interpersonal skills to challenge institutional systems on behalf of the community (Weerts & Sandmann, 2010).

As boundary spanners, *technical experts* have a role that primarily manifests as discipline or content-focused in inception; they provide significant expertise through their professional

knowledge and task-oriented focus. They are not primarily engaged in interpersonal relationship building, and their lens tends to focus on the perspective of the institution (Weerts & Sandmann, 2010). Their actions as boundary spanners are largely determined by their applied field, the extent to which their experience and background are applicable to the project, and their willingness to participate.

The third boundary spanner, known as the *internal engagement advocate*, has a role that is closest to the institution. They typically "hold leadership positions aimed at developing infrastructure for engagement," with a specific focus on "creating structures, budgets, reward systems, and promotion and tenure guidelines supportive of engagement" (Weerts & Sandmann, 2010, p. 646). The significance of this position is the rhetorical space individuals make for community engagement at the institutional level through channels such as personnel, budgets, and mission, ultimately facilitating the systems in which engagement becomes embedded in the culture of the institution so partnerships can thrive.

Finally, *engagement champions* are boundary spanners who possess leadership task orientation and the interpersonal skillset to bolster a strong, outward-facing component of their work. In this role, engagement champions use their role to develop "alliances and organizational networks to support engagement" (Weerts & Sandmann, 2010, p. 648), playing roles that are often symbolic. However, through their support, they signal to all involved the campus commitment to community engagement partnerships and the sustainability of such initiatives. Moreover, these engagement champions often partner with internal engagement advocates to create linear systems that align community engagement programs within the institution. Ultimately, the role of engagement champions as boundary spanners speaks to longitudinal support for community engagement and the enduring viability of community partnerships (Weerts & Sandmann, 2010).

Though not all researchers employ the same language or reference the same studies, similar themes emerge within and between the explanations of how individuals and institutions support and foster ties between communities and universities. Importantly, though not all studies reference networks, they are predicated on the presence of informal structures that support and sustain relationships and resource flows between communities and institutions. While some discussions focus on the actions studied and operationalized by Weerts and Sandmann (2010) as boundary-spanning roles, DePrince and DiEnno (2019) focus on the structures within institutions that support community engagement as identified by other authors. Studies with a focus on organizational factors that encourage community engagement include Kania and Kramer's (2011) *backbone support* and Cabaj and Weaver's *containers for change* (2016) as well as research on cultivating leadership in the community (Wolff et al., 2017). All mirror Stephenson's conception of collaborative complex adaptive networks in referencing the ability to develop space for discussion, debate, negotiation, and the collective creation of authentic, community-based dialogue (Hoey et al., 2017) that is essential to community engagement.

Some authors pay specific attention to the role university actors hold when they create structural holes (Burt, 2004), though frequently, the community engagement literature refers to them as boundary spanners. It is important to note that though not explicitly stated in each study, studies of boundary-spanning behavior center on the presence of networks. More specifically, studies of actors who display boundary-spanning behaviors presume they are already members of a network with actions that bridge network boundaries to create ties to one or more outside networks. One study with such assumptions elicits conceptualizations of literature-based boundary characteristics, including broad theoretical descriptions of boundary constructs (Ryser, 2019). To adequately examine the behaviors of boundary spanners, Ryser asserts that multiple descriptions

of intangible boundaries must be represented by "physical, temporal or psychological, or perceptual constructs" and "characterized by the ambiguity of standing in-between two or more socio-cultural contexts" (2019, p. 1). Ryser et al.'s 2019 examination of these network-embedded boundary spanners aligns closely with the perspective of Friedman and Podolny, where "the boundary-spanning function is actually a composite entity" (1992, p. 28), a statement that embeds boundary-spanning behavior in a relational network.

The Presence of Social Capital in Network Analysis

Social capital, as it exists in community networks, takes myriad forms across the literature. From trust, capacity, and innovation (Balfour & Alter, 2016) to the identification of complex issues and collaborative problem solving (Provan et al., 2005), the network measures of each study are context- and phenomenon-specific. For example, Balfour and Alter (2016) focus on locating network facilitators as "critical individuals who transcend social and organizational boundaries" (p. 431–432) who form a specific clique that fosters community collaboration, where network analysis serves as a method to identify said actors in their community field.

Balfour and Alter's *network facilitators* (2016) closely resemble the *boundary spanners* identified by Weerts and Sandmann (2010). In the latter, similar assumptions allow for network analysis as a methodology by which to examine boundary-spanning behavior in the O Grows community-university engagement network (OGCUEN), including the visualization of ties to demonstrate relationships. Within Balfour and Alter's conception of community, they recognize that individual interactions occur within the local environment, where overlapping social fields of individuals and organizations create structure and linkages that facilitate coordination and action (2016). This theory also specifies the role of individuals who act as organizational facilitators to establish ties among social fields through reliable interaction and communication to create a strong

network of actors. This study assumes that university boundary spanners and community actors employ a collaborative process predicated on some level of social capital similar to this community field in order to facilitate capital flow and collaboration.

Varying studies of community collaborations apply network perspectives, including one measuring university-community collaboration (Woolcott & Chamberlain, 2019); a study of community innovation through network analysis to map the interactional field, facilitators, and community development (Balfour & Alter, 2016); a network analysis that studies the friendship networks of students engaged in community engagement while in class (Teymuroglu et al., 2021); and an assessment of the utility of network analysis as a tool to strengthen community partnerships (Provan et al., 2005). Additional examples discuss changes in community networks over time, including using network analysis as a tool to evaluate academic-community partnerships studying the social determinants of health research and measuring relationships to determine the effectiveness of collaborations (Bright et al., 2017). Another investigation employs network analysis to map the embedded systems of social farms that promote a sense of community and social inclusion (Borgi et al., 2019). Each of the studies listed here relies on the same epistemological assumptions that reinforce the network perspective articulated by Paveglio et al. (2017) in their conception of the interactional field of the community as "defined by social networks and interpersonal relationships that are valued by participants" (p. 938). Though each study uses network theory, the differences in topics are a nod to the malleability of its application to research and demonstrate its use when exploring the embedded actions of actors in a network.

Woolcott and Chamberlain (2019) note the role of universities as co-creators of the collective knowledge established in a community, with "collaboration across a network of participants" (p. 18), citing network theory as a useful tool to study interactions across research contexts. The value

of network analysis across disciplines emerges from a review of the available literature, which reveals specific utility in education and community endeavors (Ahn & Rodkin, 2014; Daly & Finnigan, 2010; Dawson, 2008; Reffay & Chainer, 2003). Each study exists in conjunction with other actors, creating language and space to navigate the role of context in research and tools to quantify the structural systems. Graph theory serves as the basis of network analysis, where structural patterns of linkages (ties) between elements (nodes) are empirically examined. It includes a dynamic contingency of theories and methods that, in their application, transcend disciplinary boundaries (Berkowitz & Wellman, 1988; Borgatti et al., 2013; Scott, 1991; Wasserman & Faust, 1994). At the individual and organizational level, it is a collection of methods by which intra- and inter-organizational networks are mapped along the ties that facilitate the flow of information, including inter-organizational knowledge transfer (Müller-Prothmann et al., 2005a). Studies that focus on ties among organizations and individuals utilize the role of structural holes, structural position, network size, strength of ties, number of weak and strong ties, the interconnectedness of network contacts, opportunities for brokerage, the network centrality of a given node, and network diversity to examine and characterize a given network (Baer, 2010; Burt, 2004; McFadyen & Cannella, 2004; McFadyen et al., 2009; Mehra et al., 2001; Obstfeld, 2005; Perry-Smith, 2006; Rodan & Galunic, 2004; Rost, 2011; Zhou et al., 2009).

To establish partnerships between a university and the surrounding community, the creation and maintenance of interpersonal ties are necessary; thus, it stands to reason that a research toolkit with the capacity to demonstrate relational data through the spatialization of the connections among actors and visualize the network structure of community collaborations is a practical and informative method (Buys & Bursnall, 2007; Provan et al., 2005; Woolcott & Chamberlain, 2019). Research with a more in-depth examination presents network analysis as an evaluation tool for

this process and asserts that community engagement is contingent on relationships *and* genuine partnerships with long-standing connections fostered through the awareness of and respect for all involved (Baquet, 2012; Bright et al., 2017).

Community-University Engagement Networks

In their white paper on the democratic framework of community engagement, Saltmarsh, Hartley, and Clayton describe a university ecosystem reminiscent of a network where "the university interacts with outside knowledge producers in order to create new problem-solving knowledge through a multi-directional flow of knowledge and expertise" (2009, p. 12). Stephenson's 2011 conceptualization of collaborative complex adaptive networks and the boundary-spanning roles identified by Weerts and Sandmann (2010) exist within a shared ontology; that network space emerges when actors from university and community networks engage in collaborative processes. An empirical examination of a relational composition is possible through network analysis, and it is even possible to examine the structural and organizational indicators of boundary-spanner roles rather than focus simply on the psychological or interpersonal factors (Friedman & Podolny, 1992). Similarly, Stephenson's integrated theories, which establish the role of networks in community-university engagement, include characteristics that can be transferred to network structures and understood through social network analysis.

More than simply a heuristic by which to discuss the community engagement process, there is an untapped capacity in network analysis to investigate the characteristics of the structures established during the process when university actors engage with community members in a reciprocal exchange of ideas and resources. To represent the integration of theoretical drive and practical utilization, I offer nomenclature for the observed networks formed during the community engagement process in the space between university and community: *community-university*

engagement networks (CUEN). This identifier includes the words "community" and "university" as a recognition of the modern, bidirectional conception of community engagement where the process includes the exchange of information, ideas, and resources among all participants (Applebee, 2000; Franz, 2009; Franz, 2012) and speaks to the roles carried out by all actors in creating systems of engagement through active, adaptive ties and flows of information and resources.

Specific individuals bridge relationships that span network boundaries and act as microcosms through which community and university actors identify and prioritize perceived intersectional interests to strengthen and sustain their community-university engagement network. The actions of these individuals perpetuate the ties that create and maintain a dedicated space that exists beyond the centralized structure of the university and wherein community-university collaborations are founded on a democratic balance of involvement and resources to benefit the interests of all network actors. To create a reciprocal community-university partnership with mutuality (Anderson et al., 2019), these actors need to foster interactions that allow for an exchange of resources. Within and across these ties, the network structure is not static; rather, the iterative, dynamic tension between university and community actors facilitates reciprocal, productive collaboration, likely resulting in structural changes within the network to reflect the intentional adaptation of the evolving partnership.

Narrative case studies of community engagement focus on participant voices and faculty narratives (Anderson et al., 2019) of observed change. This approach is similar to the logic models in program evaluation, which employ the role of context as an explanatory factor of research. However, few have conducted research to demonstrate the said context as a relational composition for the exploration of ties in the community engagement process. If studies are to

move beyond this narrative examination to examine the full context of community-university engagement through adaptive models and boundary-spanning roles (Stephenson, 2011; Weerts & Sandmann, 2010), there is an impetus for a research methodology with the capability to capture context-specific boundary-spanning experiences while acknowledging the role of less visible actors. Consequently, exploring the community-university engagement network created by boundary-spanning actors who actively collaborate with community members will contribute to the discussion of community-university engagement partnerships and bolster our understanding of the relational dynamics that promote reciprocal exchange.

Chapter Three: Through the Complementary Whole

Community engagement resides at the intersection of disciplinary application and theories with transdisciplinary characteristics that inform the collaborative process, resulting in scholarship based on myriad perspectives and ideas to create a sufficient examination framework (O'Meara et al., 2010). Chapter Two synthesized the network-based theoretical constructs of community engagement and network analysis, both of which are pragmatic perspectives consistent with the paradigmatic context of the complementary whole (Johnson & Onwuegbuzie, 2004), where theories are instrumental rather than absolute. This notion of instrumentality is especially significant regarding the word *network* as used throughout this study, including the phrases *network theory* and *network analysis*.

The proliferation of the phrase *social network analysis* has resulted in an association whereby many studies use mathematical strategies to analyze the "structural properties of a social network of interconnected members" (Decuypere, 2020, p. 74). To a certain extent, the phrase *network analysis* has become subsumed into the phrase *social network analysis*; therefore, it is worth examining the instrumentality of the word *network* as used in similar applications. First, Woolcott and Chamberlain describe the utility of network theory as "a framework for interpreting patterns of interactions" (2019, p. 20) with application across research settings and organizations through visualization and measures. Second, Contandriopoulos et al. (2018) define network analysis as patterns that unite different elements with origins beyond mathematical conceptions; the authors provide a reminder that early applications were a departure from studies of individual actions and attributes to examine a broader phenomenon. Third, Decuypere uses the word *network* to identify "a method that allows to trace the complex entanglements by means of which specific practices are constituted," where the purpose of the investigation is to "come to an integrated understanding

of the relational composition of a particular practice under investigation and of the effects that these compositions generate" (2020, p. 74). Finally, the heuristic role of a network is an effective tool in the complementary whole toolkit (Johnson and Onwuegbuzie, 2004) because "networks are not only mathematical but also visual objects" (Venturini et al., 2021, p. 1) and present a relational perspective to explore data. These applications of the word *network* are not intended to be exhaustive but rather demonstrate its instrumental utility in research that resembles the definition used in my study.

Finally, assumptions throughout this study frame the pragmatic design used to answer the research questions and are held within the complementary whole (full explanation of the complementary whole on page 35). This chapter explores the rationale and methods used to gather and visualize the composite network of actors and ties in the O Grows community-university engagement network (CUEN), created through a collaboration between Auburn University and the Opelika community. It is presumed in this study that as the community engagement process unfolds, it establishes a unique space that exists only because of the relational composition of the CUEN, where the "network space is a consequence and not a condition of" (p. 3) the actors and ties (Venturini et al., 2021) that exist within the collaborative process between community and university.

This study focuses on the boundary-spanning behavior of university actors who foster the bridging relationships that create a community-university engagement network as well as how it changes over time (Provan et al., 2005; Stephenson, 2011; Weerts & Sandmann, 2010). Through an exploratory mixed methods design, this study utilizes a case study approach to synthesize observational, activity, and interview data to study the ties created by boundary-spanning behavior, both in relational terms and the change over time that is integral to "what provides particular

networks their specificity" (Decuypere, 2020, p. 76). The goal of this mixed methods design is to visualize the dynamic process of the complex, multifaceted process of community engagement with a focus on boundary-spanning behavior and network change over time, where the application of network analysis is to apply "methods that assist in giving an account of a particular practice under investigation" (Decuypere, 2020, p. 76).

Purpose and Context

When reviewing the institutional mission of engagement espoused by urban universities, Holland describes the embeddedness of the relationship as "not just in the city, but 'of the city'" (2002, p. 3); similarly, professionals at land grant institutions have the opportunity through collaboration to create community-university engagement networks that are *not just in the community, but "of the community."* Through a network analysis of the boundary-spanning behavior of community engagement professionals, it is possible to visualize the network composition created by the relationships among university and community actors. This exploratory research through network analysis seeks to demonstrate how boundary spanners take advantage of "porous boundaries" (DePrince & DiEnno, 2019, p. 24) to partner with community members, and the investigation focuses on ties and interactions rather than objects or outcomes (Borgatti et al., 2009).

The research questions explore two aspects of these ties and interactions: first, how boundary-spanning behavior creates a community-university engagement network, and second, how this behavior affects the community-university engagement network over time. The complexity of the community engagement process required a design that allowed iterative phases and fostered "sensibilities that stand central in the effectuation of a particular study" (Fenwick & Edwards, 2010, p. 76). This exploratory study resulted in an expansive, almost boundless information base

made up of narrative and numerical data, adopting the maxim that "narrative data relies on language and numerical data relies on numbers" (Contandriopoulos et al., 2018, p. 72), to visualize the O Grows CUEN. Instead of simple data collection and analysis, I engaged in concurrent data generation and transformation phases that interacted with and informed one another. Within these phases, I worked with boundary-spanning faculty to organize, translate, visualize, and discuss the breadth of ethnographic data and translate narrative and numerical constructs into relational data.

Due to the paucity of similar research studies and in consideration of the complementary whole, I continuously moved between and even juxtaposed phases to consider to what extent my transformed relational data accurately represented the ethnographic data I generated. Venturini et al. describe a similar transformation process from narrative to relational data as having "many trials and errors, and a lot of backs and forth between different visual variables and their parameterization" (2021, p. 7).

Paradigmatic Commitments

Driscoll (2008, p. 39) describes community engagement as a partnership between an institution and community "for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity," a description advanced by the Carnegie Institution. The description is laudable for its focus on process and context but remains vague, necessitating an additional level of examination to determine if community engagement has the characteristics described by Driscoll. In addition to determining if there is a "mutually beneficial exchange of knowledge and resources," it specifies that the process should occur "in a context of partnership and reciprocity." Though context is a significant factor in community engagement, there is no process to directly examine how this reciprocal exchange occurs (Giles, 2008; O'Meara et al., 2011; Sandmann, 2008; Ward, 2003). This study focuses on the individuals who participate in this process through

boundary-spanning behavior where the context-specific nature of each partnership necessitates a pragmatic, investigative approach. Therefore, this study utilizes methods predicated on the pragmatic *complementary whole* (Johnson & Onwuegbuzie, 2004), which functionally:

> (a) rejects dichotomous either-or thinking; (b) agrees with Dewey that knowledge comes from person-environment interaction (dissolving subject-object dualism) (Biesta & Burbules, 2003); (c) views knowledge as both constructed *and* resulting from empirical discovery; (d) takes the ontological position of pluralism (i.e., reality is complex and multiple); (e) takes the epistemological position that there are multiple routes to knowledge and that researchers should make "warranted assertions" rather than claims of unvarying Truth; (f) views theories instrumentally (i.e., theories are not viewed as fully true or false, but as more or less useful for predicting, explaining, and influencing desired change); and (g) incorporates values directly into inquiry and endorses equality, freedom, and democracy. (Johnson & Gray, 2010, p. 88)

Throughout my study, I applied the complementary whole of pragmatism as a methodological toolkit (Biesta, 2010) within the study and when discussing its applicability beyond this individual case. When examining the complexity of boundary-spanning behavior (Sandmann et al., 2014), the whole complementary toolkit maintains a pragmatic framework by which to synthesize network theory, community engagement, and boundary spanners through iterative phases of data generation and transformation while balancing the ontological and epistemological assumptions of the research (Johnson & Gray, 2010). This complementary whole provided a lens through which I considered all research decisions, from the initial choice of mixed methodology as a study design to the application of network theory as a tool to visualize boundary-spanning behavior.

Network analysis is a tool that can identify and visualize boundary-spanning behavior, with assumptions drawn from the *relational turn* (Depelteau, 2013), also referred to as *relationalism*, which asserts that individuals cannot be understood outside of the interactions in which they engage with human and non-human actors (Decuypere, 2020). Thus, the relationalism that underpins network analysis maintains assumptions closely aligned with the complementary whole, with a key belief that "no individual's actions can be reduced to its own capacities" (Decuypere, 2020, p. 75). Essentially, actors do not exist in a vacuum; all behaviors occur in a context where actors are capable of exerting agency on one another (Decuypere, 2020; Latour, 2007); this approach also aligns with Dewey's conception of person-environment interaction and the pluralistic nature of a complex reality in the complementary whole. However, this belief is not an absolute explanatory framework. Instead, it "should be conceived of as offering sensibilities that stand central to the effectuation of a particular study" (Decuypere, 2020, p. 76), aligning with the view that theories are only instrumental; they do not represent an absolute Truth (Johnson & Gray, 2010).

Data Generation

To capture the type of data required to demonstrate network structure, the data generation phase necessitated a closeness that resembles ethnographic methods, which focus on the unremarkable interactions, behaviors, and daily activities of boundary spanners and community actors (Decuypere, 2020; Fenwick & Edwards, 2010). This ethnographic process recalls Dewey's rejection of dualism, reinforcing the idea that we can only know the world through our actions; thus, we cannot draw conclusions independently from our lived experiences (Biesta, 2010). In addition to matching the particular needs of this study, researchers (e.g., Anderson et al., 2019)

have suggested the utility of ethnographic investigation as a tool to examine the behavior of participants in a community engagement partnership.

These ethnographic methods garnered observational and behavioral data on the interactional space between community and university (Strauss & Corbin, 1990, p. 79). Latour (1996) describes this process as resembling an ethnographic investigation that a detective might conduct, where the researcher uses their questions to connect actors and ties by following one actor and those with whom they interact at a given time, identifying one type of tie and determining when it occurs, mapping participants to an activity, or any combination thereof (Decuypere, 2020).

Data Transformation

Data generation and transformation processes were not linear or dichotomous because the goal of this study was to present "an account of a particular practice under investigation" (Decuypere, 2020, p. 76), where the *practice under investigation* is a community engagement process as it occurs among boundary spanners and other actors in the OGCUEN. The data in this study integrate ethnographic material with network analysis to determine the presence of relationships between actors through the visualization of sociograms (Bright et al., 2017). I then used approaches drawn from relationalism to place humans and nonhumans (i.e., organizations, community groups, departments, and institutions) on the same "flat, relational field" (Decuypere, 2020, p. 76) as actors in a network. Ethnographic data in narrative form typically do not include common data points often found in modern applications of social network analysis (i.e., ties, flows, relations). However, a justification exists for the application of network theory to narrative data, especially in research focused beyond the characteristics of individuals (Contandriopoulos et al., 2018).

The concurrent generation and transformation of data to make sense of the community engagement process resemble the process Woolcott and Chamberlain (2019) use in a study that

applies network analysis to an investigation of a university-community collaboration. I managed the relational data (Venturini et al., 2021) through Microsoft Excel and UCINET (Borgatti et al., 2002) and created relational visualizations in NetDraw (Borgatti, 2002). I used Microsoft Excel to organize data into a matrix where columns and rows indicate nodes and the cells signal the presence of a tie. In a one-mode network, the columns and rows have identical nodes, such as actors; a two-mode network has rows and columns to represent two different types of nodes—in this case, they represent actors and activities (Borgatti et al., 2013). I utilized the UCINET (Borgatti et al., 2002) software package throughout the data transformation, where I created one-mode and two-mode matrices (Borgatti et al., 2013) of actors and activities visualized in NetDraw (Borgatti, 2002). I then created relational visualizations to present the OGCUEN with specific boundary-spanner roles (one-mode) and snapshots of the network as it appeared each year from 2012 to 2017 with key boundary spanners and activities (two-mode; Borgatti et al., 2013).

Data transformation: Boundary spanners and structural holes

Network studies of innovation or engagement include measures such as structural position, network size, the strength of ties, the number of weak and strong ties, the interconnectedness of network contacts, opportunities for brokerage, network centrality of a given node, and network diversity, which are mediating factors on observed outcomes (Baer, 2010; Burt, 2004; McFadyen & Cannella, 2004; McFadyen & Obstfeld, 2005; Mehra et al., 2001; Perry-Smith, 2006; Rodan & Galunic, 2004; Rost, 2011; McFadyen et al., 2011 2009; Zhou et al., 2009). Boundary-spanning behavior occurs at structural holes in a network, where a node acts as a connection between two networks. Discussions of structural holes in community social capital include references to Granovetter's (1973) *strength of weak ties* as bridging social capital, described as "fostering relationships across class, ethnic, and religious lines, bridging social capital creates broader

identities and fosters social trust and norms of generalized reciprocity" (Bridger & Alter, 2006, p. 9).

In community engagement research, Anderson et al. (2019) identify the role of "micro-dynamics" of relationships formed among university and community actors, with a focus on the importance of a facilitator who prioritizes mutual benefit and can "bridge any gaps" that arise between community and university (p. 12). In an examination of boundary-spanning behavior and social capital in community engagement, network analysis provides a tool to visualize and explore the relational composition created through the collaborative process. For this study, the instrumental perspective of the complementary whole is a foundational assumption that creates a pragmatic framework whereby different perspectives on the utility of structural holes and social closure maintain relevance through the context of research application.

Measures in network analysis abound, but those applied in this study are relatively simple. Centrality indicates an actor's relative position in the relational composition of a network. Often the most straightforward indicator of a given actor's position in a network is *degree centrality*, which measures the number of ties a given node has, whereas *betweenness centrality* measures how frequently a given node (actor) falls on the shortest path between otherwise disconnected nodes. An actor with high betweenness centrality indicates a network position that presents opportunities for boundary-spanning behavior because the individual serves as a tie between other actors (Borgatti et al., 2013; Freeman, 1977). The desired position and centrality of a boundary spanner are entirely dependent on their behavior in the network, and this study contextualizes these centrality measures relative to the *practice* it investigates (Decuypere, 2020) as well as "conceived of as offering sensibilities that stand central to the effectuation of a particular study" (Decuypere, 2020, p. 76).

Data transformation: Boundary spanners and network change over time

This exploration of the O Grows CUEN transmutation at the network level includes a visualization of the relational composition as it exists each academic year, beginning in Fall 2012 and ending in Spring 2017. Commonly utilized indicators of network-level characteristics within each year offer measures of the collaborative process in a community-university engagement network because they quantify interactions and reachability among network members (Wasserman & Faust, 1994). Descriptive measures such as the number of active nodes, activities, community actors, and university actors provide indicators that, when paired with descriptive data, provide additional data points to make sense of changes in the CUEN over time. In a two-mode network, the degree of centrality of an activity indicates the number of actors tied to it (Borgatti et al., 2013; Freeman, 1977). In keeping with the complementary whole, descriptive measures selected to examine a network do not provide indicators that stand in isolation; instead, they follow the same assumptions and context that exist within the network.

An initial examination of a network may involve its size or the degree of one or more actors within it, where the degree simply represents the number of connections a given individual holds (Borgatti et al., 2013; Carolan, 2014). It is important to note that this degree has no absolute value; rather, it should be considered relative to the function of a network in context. Thus, in an examination of the data generated through network analysis, the network structure, size, and composition should be considered relative to one another (Borgatti et al., 2009; Borgatti et al., 2013; Carolan, 2014; Crossley et al., 2015; Vicsek et al., 2016).

Context and Ethical Paradigm: A Nod to Equality, Freedom, and Democracy

Together with the citizens of Opelika, the boundary spanners of Auburn University have co-created the OGCUEN as an established collective space to meet ongoing community and

university needs focused on social justice and food equity. Members of the OGCUEN hold an asset-based perspective of community engagement with assumptions that all collaborators in the network benefit from the ties created during the process, regardless of the quantity or quality of resources they bring into the partnership. The OGCUEN defies traditional systems of academic expectations; it transcends disciplinary boundaries within the university, engaging faculty and students from multiple disciplines and fostering broad community involvement. The complexity of activities carried out by boundary spanners is reflected in the focus on community voice and autonomy within the partnership and occurs at individual and organizational levels (Weerts & Sandmann, 2010). Within the community, individuals and organizations across regional sectors, including schools, farmer's market vendors and patrons, non-profit arts and historical associations, the juvenile judicial system, local government, and local corporations and business associations, have established relationships within the OGCUEN.

The O Grows CUEN began through social community participation and developed into a comprehensive network composed of people who were drawn to the partnership because it was rooted in the history, geography, and people of Opelika. A consistent characteristic of the O Grows community-university engagement network is a commitment to authentic participation with community members, resulting in a collective and responsive participative process for all involved. While research questions in this study focus on the university boundary spanners, they could not do their work without the community members who granted them access to their community resources and engaged so thoughtfully with the university. A significant consideration in the application of network theory to this study was the drive to create a methodological system through which the presence of community actors could be visualized alongside university actors because a

democratic investigation of community engagement should illustrate their agency in the partnership.

Research Study: Site and Participants

The site for this study is Lee County, Alabama, home to Auburn University, a land grant institution that holds the Carnegie designation for community-university engagement. This case study focuses on a community-university partnership between Auburn University and the neighboring community of Opelika, Alabama, a collaboration listed as an accepted criterion for the Carnegie designation. It includes the ties and actors that comprise the O Grows community-university engagement network. In this CUEN, boundary spanners (Weerts & Sandmann, 2010) from Auburn University have established partnerships and, over time, a collaboration comprised of university and community actors focused on food equity and social justice.

At the time of data organization and analysis, the OGCUEN had evolved to address issues of educational support and school gardens, food security, and access to resources for marginalized students. Projects based on these efforts include career training at an alternative school, managing a community garden and the local farmers market, and an internship program for students expelled from the traditional public school system. The project began when one faculty member identified the outdoor area of a local school where he could work in a garden with his son; this moment was the start of a burgeoning, nonlinear collaborative network in the space created between the university and the community. The OGCUEN evolved authentically through educational activities, community gardening and farming, support from community members of different sectors, and a shared vision among participants. A garden was the initial tie created between a faculty member and the school, and community-led ideas, insight, access, and resource-sharing bolstered the development of a dynamic engagement between the Opelika community and Auburn University.

Due to the ethnographic orientation (Fenwick & Edwards, 2010) of this study, the nature of participation varies depending on the type of data I generated from my interactions with a given actor. For example, when observing activities attended by the public or large groups, I did not communicate with people with the intent of garnering research data; instead, my goal was to understand and describe the composition of how the OGCUEN functioned across settings and participants (Decuypere, 2020; Latour, 2007; Venturini, 2010). Through work with faculty boundary spanners in the OGCUEN, I identified several community and university actors who held central roles at the start of the collaboration, and with those individuals, I conducted semi-structured interviews with IRB-approved consent. In these semi-structured interviews, the discussion focused on their initial interest in the O Grows project, and subsequent questions emerged organically from this primary inquiry.

Table 1: Actors in the O Grows Community-University Engagement Network (2012–2018)

PARTNER	ACTOR	SECTOR		PARTNER	ACTOR	SECTOR
C	Area Vendors	BUS		C	Carver-Jeter Project	NONPROF
C	Arricia	BUS		C	EAAA	NONPROF
C	BEE & H2O	BUS		C	EAFB	NONPROF
C	Cottonseed Studios	BUS		C	Envision	NONPROF
C	Home Depot	BUS		C	Junior League, Lee County	NONPROF
C	Kohl's	BUS		C	KOB	NONPROF
C	Lowe's	BUS		C	OG FM	NONPROF
C	OG FM Vendors	BUS		C	Opelika Main Street	NONPROF
C	Scot's Miracle Gro	BUS		C	Samford Foundation	NONPROF
C	Smith T Hardware	BUS		U	Andrzejewski	HIED
C	Turner Fencing Company	BUS		U	AU AG	HIED
C	Zazu Gastropub	BUS		U	AU Extension	HIED
C	Community Members	CITIZEN		U	AU GRAD Students	HIED
C	PAB	CITIZEN		U	AU HDFS	HIED
C	AL State FM Authority	GOVT		U	AU Hort. Club	HIED
C	City Council	GOVT		U	AU Hort. Dept.	HIED
C	City Maintenance	GOVT		U	AU MBA Program	HIED

C	Juvenile Justice of Lee County	GOVT		U	AU Outreach	HIED
C	Juvenile Probation System	GOVT		U	AU Outreach Global	HIED
C	Mayor's Office	GOVT		U	AU Soils	HIED
C	Tuskegee Faculty	HIED		U	AU Sustainability	HIED
C	Hartley	K12		U	AU UG Students	HIED
C	Morris Avenue	K12		U	Cook	HIED
C	Northside Intermediate	K12		U	Downer	HIED
C	OCS	K12		U	Forbes	HIED
C	OG Interns	K12		U	Kensler	HIED
C	OHS	K12		U	Parrish	HIED
C	OLC	K12		U	Quansah	HIED
C	OMS	K12				
C	Southview Elementary	K12				
C	West Forest	K12				

Research Study: Data Generation

I collected data for this study in partnership with faculty from the College of Education at Auburn University. I visited community meetings and K-12 schools, observed service-learning opportunities, and attended events at and in relation to the farmer's market, organizational program meetings with local partners and government agencies, planning sessions for fundraising events, and Participant Advisory Board meetings to plan grant proposals. The study relied on observational records and purposeful sampling through the intentional recruitment (Woolcott & Chamberlain, 2019) of actors within the OGCUEN, but participant actors represented a broad range of community sectors and university boundary spanners. Therefore, to create an adequate representation of the complexity of the OGCUEN, my goal for data generation was to observe actor participation, identify new ties through existing ones, find the types of interactions that occurred and define the nature of their occurrence, and establish researcher understanding of the nature of ties (Decuypere, 2020).

The data generation and transformation processes unfolded concurrently with my semi-structured interview approach. In addition to continuous observational data collection, I conducted multiple semi-structured interviews with participants, including boundary spanners deeply engaged in the network. To attain different longitudinal viewpoints and perspectives of the ongoing collaboration over time, I recruited interviewees based on their long-term involvement with the program and their developing role in the OGCUEN. The boundary-spanning faculty in this study had robust institutional knowledge about the history and ongoing development of the OGCUEN. Each semi-structured interview started with the same opening request: "tell me about your work with O Grows." These interviews centered on the perspectives of myriad community and university actors, discussing their motivation for partnership and their perceptions of the burgeoning community-university engagement network.

On a formative basis throughout generation and transformation, I organized data through a qualitative content analysis, where I applied "the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns" (Hsieh & Shannon, 2005, p. 1278) to review the generated data and populate the descriptions of partnerships and relationships in the OGCUEN. The continuous process of ethnographic data generation resulted in data from multiple sources (i.e., event email reminders, event sign-ins, and observational data at the event). Consequently, I could cross-check my work before confirming it with faculty boundary spanners with the option to find more data sources or conduct follow-up inquiries to enhance data clarity.

The longitudinal aspect of this study was especially interesting, and I found my goal was to "trace and present the work and entanglements that go into producing and sustaining a particular practice" (Decuypere, 2020, p. 79), the "practice" being the community engagement process. This

effort generated significantly more data than are included in this study, and two factors influenced the data utilized and presented. First, the transformation to relational data necessitated only flat data points to capture the interactions among actors (Decuypere, 2020; Latour, 2007; Venturini, 2010). Second, the decisions about transforming narrative and numerical information into relational data and the subsequent visualization of said data were influenced by the research project and research questions (Decuypere, 2020).

Research Study: Data Transformation

Together with observational and interview data, a timeline, and explanations of actions, activities, meetings, events, and discussions between Fall 2012 and Spring 2017, I generated a basic map of the observable ties among actors in the network. I then synthesized interview data with observational data such as actor characteristics, ties among actors, and a timeline of events and activities to develop a relational perspective of the community-university engagement network and boundary-spanner activities and interactions.

The transformation process occurred concurrently with the generation process and involved iterative phases where I reviewed partnerships, events, processes, and discussions for relevance and practical application, entered them as relational data into Excel, and visualized them for clarity. As the OGCUEN became more visible, university and community actors entered the network as individuals and groups looked for intersecting interests and offered and requested support. The OGCUEN encourages new actors to find meaningful connections within the network, so not all actors who expressed interest were consistently involved. During one iteration of data transformation, I tried eliminating actors with brief or inconsistent involvement from the matrices used to create network compositions. For example, early events involved actors who came to a single activity or meeting, so I removed them to reduce the crowding of the relational composition.

However, this decision meant the network did not convey a complete picture of the community engagement process, as I found out during a discussion with the boundary-spanner faculty member, who immediately noted that the relational compositions were incomplete for some activities and, therefore, inaccurately presented the process. Upon reflection, the importance of all known data points, however fleeting, became clear: the visible aspects of the community engagement process are undeniably complex; thus, it is safe to propose that there are many unobserved actions in the CUEN that cannot be known or mapped to the network.

I worked with boundary-spanning faculty to review and assign relational characteristics to the generated data to transform the narrative data into nodes that represent actors and lines to represent ties among the nodes (Borgatti et al., 2013). I also reviewed descriptions of boundary-spanner roles (Weerts & Sandmann, 2010) relative to the actions of involved parties at Auburn University to identify whether any of the Weerts and Sandmann roles were evident from my observations. I continuously visualized data throughout generation and transformation to synthesize information and determine how to organize and visualize relational ties across the various levels of data from the OGCUEN. I conducted numerous iterations of data formatting followed by data transformation (Borgatti et al., 2013) using UCINET (Borgatti et al., 2002) and NetDraw (Borgatti, 2002) to determine how to capture the boundary-spanning behavior of faculty in the network relative to the breadth of other data points. In addition to data visualization, I placed boundary spanners in the relational composition, and I included network-level indicators to measure network characteristics.

The Network Structure of the O Grows Community-University Engagement Network

Boundary-spanning behavior exhibited by community engagement professionals occurs within the bridge that is formed within organizational partnerships (Scott, 1991), with a specific focus on how these interactions facilitate ties between campus and community and an essential recognition

that these ties are "shaped by a number of complex social, cultural, and political factors" (Weerts & Sandmann, 2010, p. 636). Specifically, the ties in this study emerged from the ethnographic data to indicate any form of known agency exerted among actors in the network (Decuypere, 2020; Latour, 2007) and to present the community engagement process "characterized by emergent interactions between various actors" (Decuypere, 2020, p. 75). In addition to conversations, meetings, projects, and attendance at activities or events, the relational ties might include any of Lin's (1999) four elements of network-based social capital: the flow of information, influence and power, social credentials, and reinforcements of access to resources or other entitlements. The inclusion of diverse ties captures the emergent, interrelated process of community engagement facilitated by boundary-spanning behavior and the network developed between the university and its surrounding community, where the spatialization of relational ties does not "just project networks into space—they create a space that would not exist without them" (Venturini et al., 2021, p. 3).

I took initial steps with the ethnographic data to transfer descriptive language into an Excel spreadsheet that captured details relevant to the process between boundary spanners and community actors. As a result, I found the bridging social capital of weak ties (Granovetter, 1973) and Lin's (1999) social capital elements within the interview and observational data to capture the agency exerted (Decuypere, 2020; Latour, 2007) between actors. This process resembles the work of Contandriopoulos et al. (2018), who transform complex narrative data into relational data to conduct relational analysis.

In one- and two-mode relational datasets, the ties indicate any type of observed agency exerted between actors, including meetings, activities, conversations (Decuypere, 2020), and any of Lin's four social capital elements. In this novel exploration of the OGCUEN, I selected two different

applications of relational data to understand the community engagement process. The first use presents a one-mode network composition that indicates ties among actors from the community and university and focuses on including the primary boundary-spanner roles explored in the first question. The second approach maintains the activities with actor data within a two-mode network to capture the behaviors of boundary spanners in the O Grows CUEN each academic year.

Figure 1: Example of Ethnographic Data

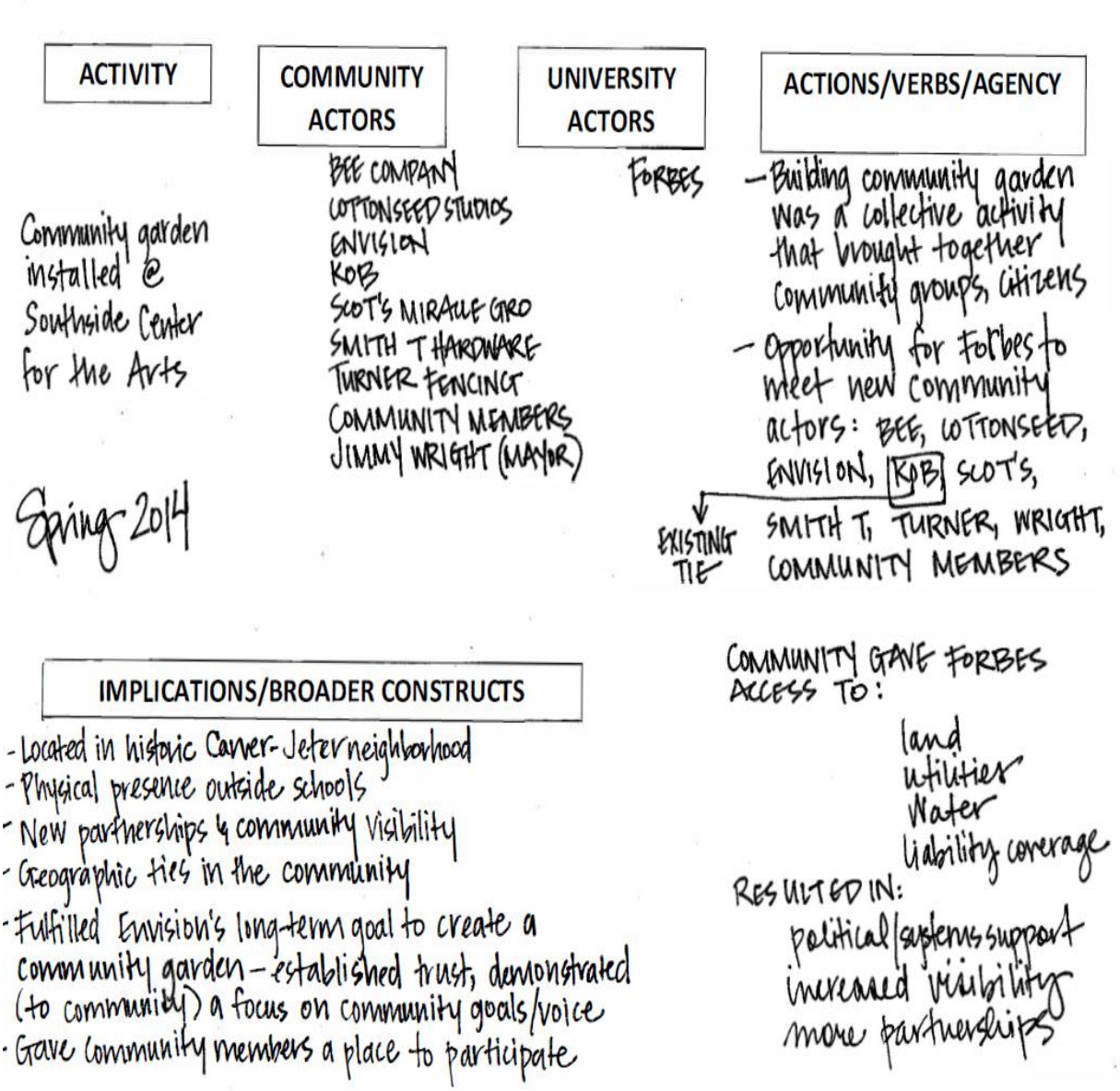
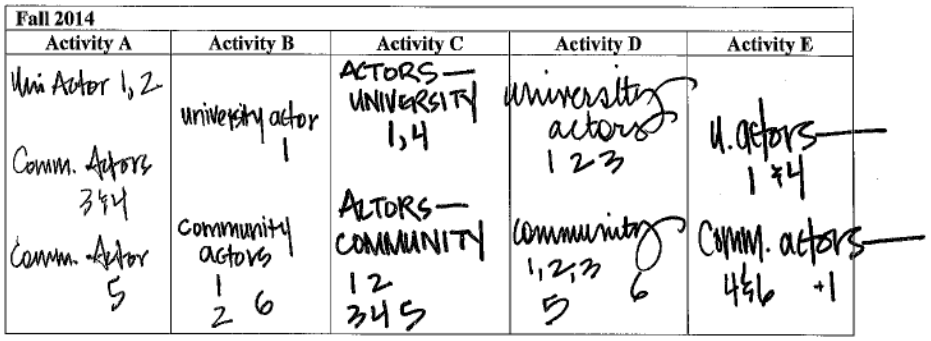
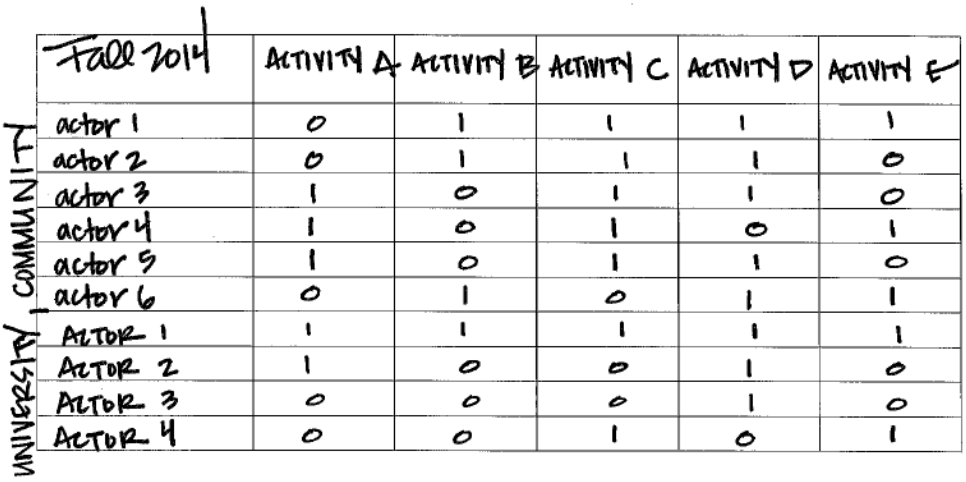


Figure 2: Two-Mode Matrix (Actors x Events)



Fall 2014				
Activity A	Activity B	Activity C	Activity D	Activity E
Uni Actor 1, 2 Comm. Actors 3 & 4 Comm. Actor 5	university actor 1 community actors 1 2 6	ACTORS— UNIVERSITY 1, 4 ACTORS— COMMUNITY 1 2 3 4 5	university actors 1 2 3 community 1, 2, 3 6 5	U. actors— 1 & 4 Comm. actors— 4 & 6 +1



	Fall 2014	ACTIVITY A	ACTIVITY B	ACTIVITY C	ACTIVITY D	ACTIVITY E
COMMUNITY	actor 1	0	1	1	1	1
	actor 2	0	1	1	1	0
	actor 3	1	0	1	1	0
	actor 4	1	0	1	0	1
	actor 5	1	0	1	1	0
	actor 6	0	1	0	1	1
UNIVERSITY	ACTOR 1	1	1	1	1	1
	ACTOR 2	1	0	0	1	0
	ACTOR 3	0	0	0	1	0
	ACTOR 4	0	0	1	0	1

Figure 3: One-Mode Matrix (Actors x Actors)

Fall 2014	CA1	CA2	CA3	CA4	CA5	CA6	UA1	UA2	UA3	UA4
CA1	x	1	1	1	1	1	1	1	1	1
CA2	1	x	1	1	1	1	1	1	1	1
CA3	1	1	x	1	1	1	1	1	1	1
CA4	1	1	1	x	1	1	1	1	0	1
CA5	1	1	1	1	x	1	1	1	1	1
CA6	1	1	1	1	1	x	1	1	1	1
UA1	1	1	1	1	1	1	x	1	1	1
UA2	1	1	1	1	1	1	1	x	1	0
UA3	1	1	1	0	1	1	1	1	x	0
UA4	1	1	1	1	1	1	1	0	0	x

Research Question One: How Do Boundary Spanners Create a CUEN?

A primary assertion of this study argues that the ties formed by university actors who collaborate with community members create a community-university engagement network in the interactional space between community and university (Strauss & Corbin, 1990, p. 79). That is, the composite network of actors and ties in the O Grows CUEN has formed through the collaborative process between Auburn University and the Opelika community, establishing a unique space that exists because of the relational composition of the network. This section aims to use boundary-spanner roles (Weerts & Sandmann, 2010) to identify one key actor per role and visualize the network structure created through their boundary-spanning actions. Across this study, multiple university actors match the descriptive characteristics outlined by Weerts and Sandmann (2010); since this study is a novel exploration of how these roles fostered the creation of a community-university engagement network, I selected actors whose actions within the network appeared to affect the early development of the OGCUEN. I explored each boundary-spanner role through a one-mode network of the 2016–2017 OGCUEN. This process included an overview of the actions that appeared to affect community engagement in the community-university

engagement network *form*, described as "the way a practice is constituted, and the relational distributions present within this practice" (Decuypere, 2020, p. 76).

Network measures from social network analysis were applied to these data sets because part of the complementary whole relies on "knowledge as both constructed *and* resulting from empirical discovery" and holds the epistemological stance that "there are multiple routes to knowledge" (Johnson & Gray, 2010, p. 88). The first research question focused on how boundary spanners form a community-university engagement network, so the network measures applied in this section indicate degree and betweenness centrality. Degree centrality specifies the number of ties a boundary spanner has in the 2017 OGCUEN, and betweenness centrality demonstrates how often an actor (node) "falls along the shortest path between two other nodes" (Borgatti et al., 2013, p. 174). The purpose of including these measures is to enhance my interpretation of the OGCUEN by juxtaposing network measures with narrative descriptions of the boundary spanners in the network. Moreover, to draw justifiable assertions, this mixed methods investigation of the OGCUEN necessitated multiple perspectives to make sense of the complex collaborative process between the Opelika community and Auburn University.

Table 2: Boundary-Spanner Roles (Weerts & Sandmann, 2010)

	Broad description of observable actions	**General level of interaction**
Community-based problem solver *FORBES*	Lead transformational community change; work on solving problems and acquiring resources; negotiate expectations and break down barriers	Development and management of partnerships
Technical expert *ANDRZEJEWSKI*	Possess significant disciplinary expertise and typically contribute as content expert and researcher; tend to be more closely aligned with the institution	Engage with the partnerships as expert support
Internal engagement advocate *DOWNER*	Occupy leadership positions or support leaders to facilitate infrastructure creation for engagement; lends credibility and commitment to partnership	Participate in the partnership by creating internal structures and shifting institutional culture to perpetuate ties

Engagement champion *COOK*	Most likely to be situated in high leadership roles where their participation represents strategic and symbolic support for the partnership; often heavily focused on fundraising and political action to bolster alliances	More than rhetorical participation; capable of bringing about organizational change and can shift culture
**An essential consideration by Weerts and Sandmann: these categories are not distinct nor static; rather, the titles are intended to help make sense of the complex nature of community engagement professionals and how they work across boundaries to engage with community actors. Importantly, the authors created them to help researchers move beyond job titles to recognize community engagement behavior beyond a job description.*		

Research Question Two: How Does Boundary-Spanning Behavior Affect a CUEN Over Time?

The network created by boundary spanners indicates the interpersonal ties among actors in the Opelika community and at Auburn University as they participate in the community engagement process. Another factor in the partnership is mutuality (Anderson et al., 2019), which exists in the collaboration and compromise between community and university interests, affecting the relational composition of the CUEN. A longitudinal network perspective of community engagement provides additional data to explore how boundary spanners navigate the hopes of other actors in the network and maintain a responsive dialogue that is inclusive of community expectations for the partnership. The snapshots of network composition over five academic years indicate the importance of relational visualizations that include unique network characteristics as they change over space and time (Decuypere, 2020).

I include network measures with descriptions of each year to enhance the exploration of relational data across a longitudinal span of five years and to recognize diverse paths to knowledge. This question also presents different insights into the complexity behind the network created by boundary spanners where university and community actors work together in the community engagement process. I found that many standard measures established in network analysis refer to

a one-mode network, so network measures of a two-mode network are specific to the question under investigation. Thus, for each academic year, I applied network measures to this relational network of actors and activities that would bolster my understanding of how boundary-spanning behavior changed the OGCUEN over time. These measures include the number of active nodes, university actors, activities, and community actors, as well as the activities with the highest participation, as indicated by degree measures.

Chapter Four presents visual and descriptive materials to answer both research questions, where one-mode networks illustrate the OGCUEN with boundary-spanner roles, and two-mode networks present snapshots of each academic year between 2012 and 2017. Each relational composition includes a description of the practice under exploration in the generated network; for the first question, this includes the behavior of each primary boundary spanner, and for the second question, it is a short description of the events occurring in the OGCUEN at the time. This pairing of network and descriptive information in Chapter Four demonstrates the composition of practice and includes the "narrative function" of the network construction (Decuypere, 2020, p. 85).

Chapter Four: Visualizing a CUEN

This study aimed to explore the community-university engagement network (CUEN) created by boundary-spanning professionals as they collaborate in community engagement, as well as how the CUEN has changed during the collaborative process. The nature of ethnographic data generated over time resulted in an expansive collection of materials to answer the research questions. As the primary instrument of this study, I applied the assumptions of the complementary whole (Johnson & Onwuegbuzie, 2004) to maintain internal alignment among study elements as I moved through the research. Therefore, this chapter presents data to answer research questions about the network created by boundary spanners and how the OGCUEN structure changed over time. Simply put, this study applies relational analysis to explore the network created during the community engagement process of a specific CUEN: O Grows.

This chapter presents the data as visualized (Venturini et al., 2021) to explore a community-university engagement network through the perspective of four exemplar boundary-spanning individuals whose early behaviors were factors in the growth of the OGCUEN as it developed through the first five years. These four individuals emerged from a group including many Auburn professionals who supported the growth of the OGCUEN; I selected them for close examination because their actions were identifiable in the formative years of the partnership. Thus, the research questions investigate boundary-spanner roles through a visualization of the CUEN to demonstrate this community engagement process as a "method of research, creative work, teaching, and learning that emphasizes university-community partnerships characterized by mutual benefit and reciprocity" (DePrince & DiEnno, 2019, p. 24). The generation and transformation of data in this study are based on a synthesis of the relational perspective in community engagement (boundary-

spanner roles, learning action networks, complex adaptive networks) and the presentation of the data through network analysis.

Section One: How Do Boundary Spanners Form a Community-University Engagement Network?

This section presents each boundary-spanner role as an enlarged node in the one-mode OGCUEN as of 2017. Each boundary spanner's section includes a description of their behavior and visualizes their network position and measures. To create these spatializations, I transformed the data generated through the ethnographic process into a one-mode network (Borgatti et al., 2013), where all nodes represent human or non-human actors in a relational field and the presence of a tie indicates some agency (i.e., conversation, attendance at an activity, shared resources, information flow) between the actors (Decuypere, 2020).

The following subsections include a spatial representation of the O Grows CUEN established during a collaborative process between Auburn University and the Opelika community. They illustrate how each exemplar boundary-spanner role appears in the network, including visualization (Venturini et al., 2021), measures of degree centrality and betweenness centrality (Borgatti et al., 2013; Freeman, 1977), and a description of ethnographic data generated to inform the network composition and boundary-spanner roles (Contandriopoulos et al., 2018; Venturini et al., 2021; Weerts & Sandmann, 2010).

Table 3: Section One Network Measures Overview

Section One Network Measures	
Degree Centrality	Indicates the number of ties connected to a given node. In the OGCUEN, there are 59 nodes, so for any actor, the highest possible degree is 59-1=58. In relational terms, this figure indicates how many connections an actor has in the CUEN.
Betweenness Centrality	Measures how often an actor (node) appears on the shortest path between any two other nodes in the network. Betweenness centrality is usually used to describe the potential of a given actor to control the flow of resources in the CUEN.

Figure 4: Snapshot of O Grows CUEN 2017

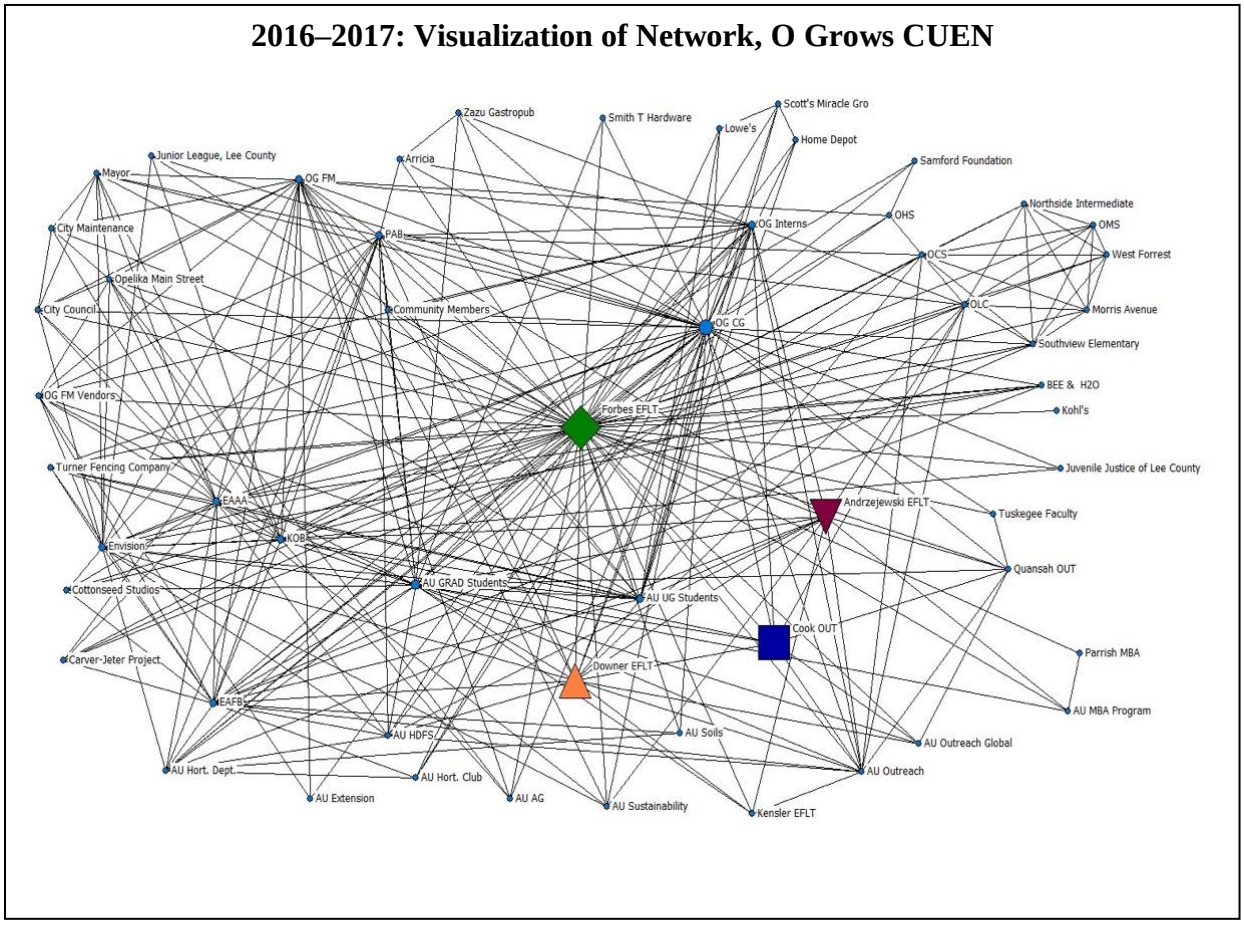


Table 4: Section One Overview of Boundary Spanner Actors

	Relational Descriptors			Network Measures, 2017	
	Boundary-Spanner Role	**Job Title in 2017**	**Initial Entry into Network**	**Degree Centrality**	**Betweenness Centrality**
Forbes	Community-based problem solver	Associate Professor, EFLT	School garden in Opelika	58	814.688
Andrzejewski	Technical expert	Associate Professor, EFLT	K12 support with Forbes	15	13.256
Downer	Internal engagement advocate	Department Head, EFLT	GA position funding	16	9.863
Cook	Engagement champion	Associate Provost and V.P. for University Outreach	Funding for OG Interns	10	3.048
**EFLT is the Department of Educational Foundations, Leadership, & Technology in the College of Education*					

Community-based problem solver: Forbes

Weerts and Sandmann describe the "social closeness to the community and a task orientation that is largely technical and problem based" (p. 642) as characteristics of the community-based problem solver. The boundary-spanning work of Dr. Forbes is the catalyst for this partnership, and together with Opelika community members, he has fostered a level of engagement that encourages intentional adaptation in response to the voices emerging from the partnership. In addition to this primary role as a community-based problem solver, Dr. Forbes acts as a composite bridging actor who willingly takes on intellectual and physical work on behalf of the collaboration in such a way that he is perpetually interacting within and across groups to sustain the OGCUEN.

The O Grows community-university engagement network (OGCUEN) began with a social tie between an Opelika neighborhood school and Dr. Forbes, a tenured associate professor in the Department of Educational Foundations, Leadership, and Technology in the College of Education at Auburn University. Dr. Forbes started volunteering at the school as a community member, and the principal and staff welcomed his willingness to work in the school garden. Though Dr. Forbes

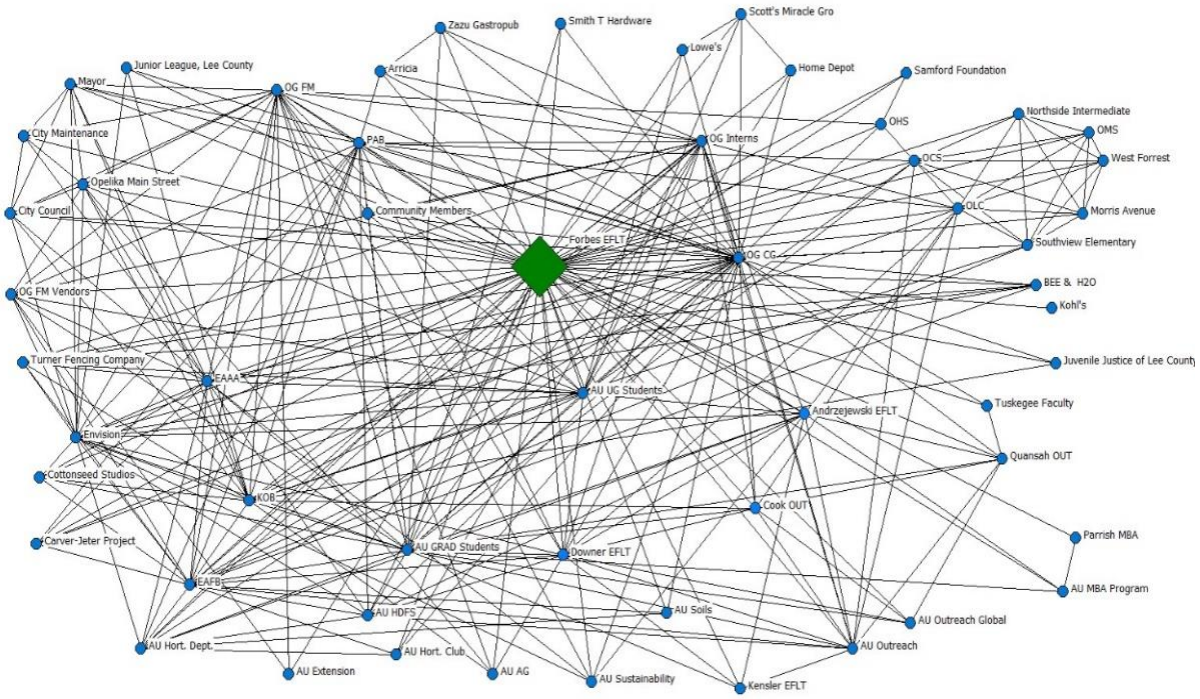
worked at Auburn University when he began volunteering, the educational community in Opelika was not seeking a partnership with the institution because they had historically experienced inconsistent or unpredictable engagement. As word of Dr. Forbes's work in the garden and with staff spread, other schools in the district invited him to help, and community members became accustomed to having his support. In response to burgeoning community interest in gardens and outdoor spaces, Dr. Forbes began to offer resources and expertise from the university and established service-learning opportunities for Auburn students, accepting advice and recommendations from community members about where help was needed.

While carrying out daily tasks and managing expectations and resource needs, he remained open and responsive to those in the community who wanted to talk to him, regardless of the topic (i.e., gardening, food security, local agriculture, community history, arts and culture, farming with mules, education, the local justice system). These diverse themes emerge in the visible changes in the O Grows community-university engagement network over time, from the breadth of community and university actors to the types of interactions within the network structure. Through reciprocal exchanges between Auburn and the Opelika community, the number and type of organizations collaborating within the O Grows partnership demonstrate an intentional adaptation of the network. Dr. Forbes is an exemplary community-based problem solver because this level of practice was essential to the creation and development of the OGCUEN; his work in the partnership has expanded, but he is first community-based because he recognized the value of showing up to work in *and with* his community.

Figure 5: Community-Based Problem Solver, Dr. Forbes

Forbes
Degree Centrality: 58
Betweenness Centrality: 814.688

The ties attached to Dr. Forbes in this visualization are indicative of his responsive, open boundary-spanning behavior; he is connected to every other actor in the system and is located between many actors in the network.



Technical expert: Andrzejewski

As boundary spanners, *technical experts* engage in research and support through professional knowledge; they do not often foster ties with community actors and lend support through an institutional perspective (Weerts & Sandmann, 2010). Before the OGCUEN inception, Drs. Andrzejewski and Forbes worked together on research, curricular, and methodological projects within the EFLT Department. As Dr. Forbes began integrating the Opelika community projects into his work with Auburn students, Dr. Andrzejewski served as a sounding board to navigate the institution's requirements for service-learning protocols. As the community engagement process revealed an interest in food security in Opelika, she provided structure and insight into the

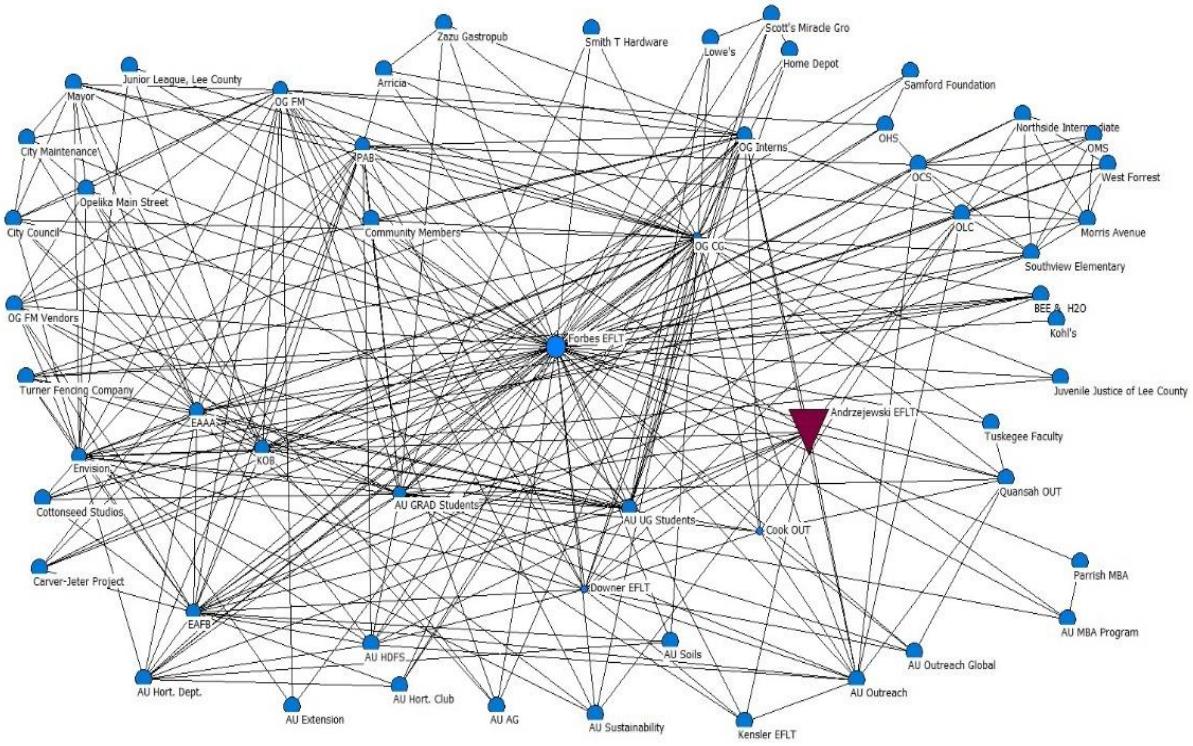
community-led process necessary to create a Participant Advisory Board as a component of the community and local food proposal requirements for obtaining federal grants. When it was time to write formal grant applications, Dr. Andrzejewski bolstered the rigorous design and evaluation process required and offered structural insight into project management. Throughout her involvement in the OGCUEN, Dr. Andrzejewski also acted as an advisor to graduate students participating in or researching the network and their projects (i.e., research studies, mentoring undergraduate students in the schools, service-learning support, IRB proposal feedback). Further, she worked with other faculty in the department to create opportunities for student-generated research in OLC through youth participatory action research (YPAR). Finally, Dr. Andrzejewski actively sought out institutional opportunities to gain recognition for the OGCUEN by nominating Dr. Forbes and the partnership for grants and awards that would increase awareness of and participation in the collaboration.

The internal expertise of Dr. Andrzejewski contributed to how the work was translated to different mediums to enhance the visibility of the collaboration, established another source of academic support for graduate students, and enabled university actors out in Opelika to manage the interpersonal ties and resources necessary to keep up the physical space of the OGCUEN. Her work as an exemplary technical expert provided internal support and, through careful consideration of how the OGCUEN was developing, supported opportunities that would increase the visibility of the partnership.

Figure 6: Technical Expert, Dr. Andrzejewski

Andrzejewski
Degree Centrality: 15
Betweenness Centrality: 13.256

The internal focus of Dr. Andrzejewski's work is evident in the ties in her boundary-spanner network and reflect her work for the OGCUEN, with an external tie to the O Grows Interns through the YPAR project.



Internal engagement advocate: Downer

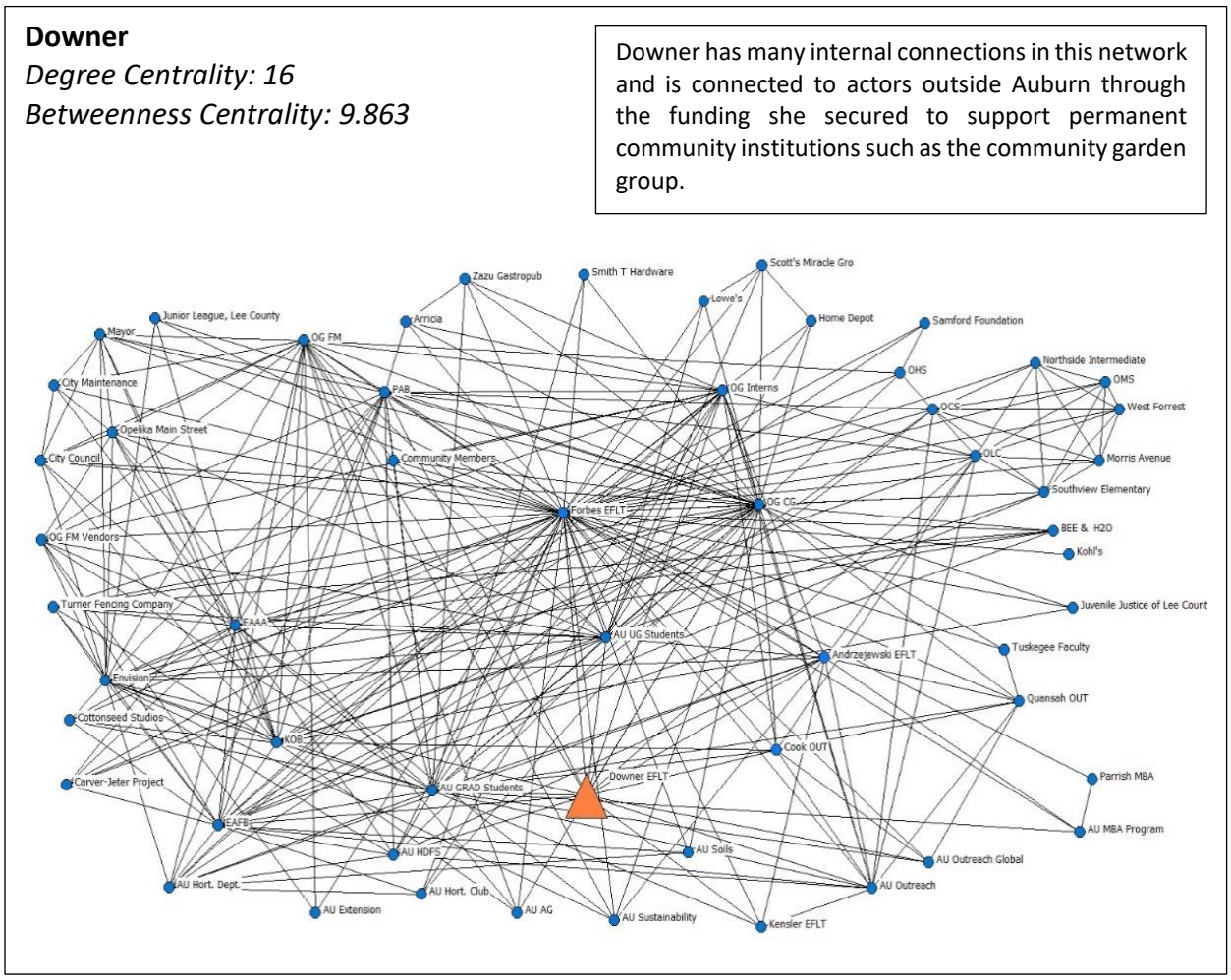
Internal engagement advocates are typically aligned closely within the institution and often "hold leadership positions aimed at developing infrastructure for engagement," with a specific focus on "creating structures, budgets, reward systems, and promotion and tenure guidelines supportive of engagement" (Weerts & Sandmann, 2010, p. 646). This role is especially notable because they often are not found interacting directly with the community, but they occupy "rhetorical space" that can bolster a community engagement project at the institutional level because they control the flow of funds (Weerts & Sandmann, 2010, p. 646). Moreover, these

actions often appear at the system level within the institution and make it possible to perpetuate the presence of the engagement partnership within the institutional culture such that collaborations are sustainable.

In the case of the OGCUEN, Downer was the department head when Dr. Forbes began taking on more projects in Opelika, and she was quick to recognize the value in Dr. Forbes's outreach efforts even though they did not align precisely with the institutional business model. Though the main requirement for community engagement is simply a dedication of time, Downer helped Dr. Forbes navigate the intersectionality of his work and funding, especially since outreach is rarely a revenue-producing model. The first action Downer took on behalf of the OGCUEN was to add a half-time graduate assistantship position (GA), a financial and symbolic move that elevated the visibility and sustainability of O Grows and gave Dr. Forbes institutional support. As the OGCUEN blossomed, Downer often provided matching funds for federal grants, matched institutional grant awards, and reached out to Dr. Cook to request funding to support the O Grows Internship Program. Finally, she made it possible for members of the OGCUEN to travel to Cape Coast, Ghana, on behalf of EFLT with Dr. Cook and establish connections with faculty at Cape Coast University.

Downer had been at Auburn University for over 30 years and was Dean of Libraries before she joined EFLT. Her background did not position her as a traditional academic with a terminal degree. That experience benefited the OGCUEN because she understood and could navigate the politics and business of institutional expectations with a pragmatic and practical perspective. She is an exemplary internal engagement advocate because she created sustainability and value at an institutional level for the OGCUEN.

Figure 7: Internal Engagement Advocate, Sherri Downer



Engagement champion: Cook

Engagement champions support community engagement through their outward-facing leadership positions and use their role to develop "alliances and organizational networks to support engagement" (Weerts & Sandmann, 2010, p. 648). Their role as boundary spanners is often symbolic, but their support demonstrates to others that the institution is committed to the community engagement partnership and signals the longevity of the project. They often work at the system level to create alignment within the institution to support community engagement efforts (Weerts & Sandmann, 2010). When Dr. Cook, Associate Provost and Vice President for

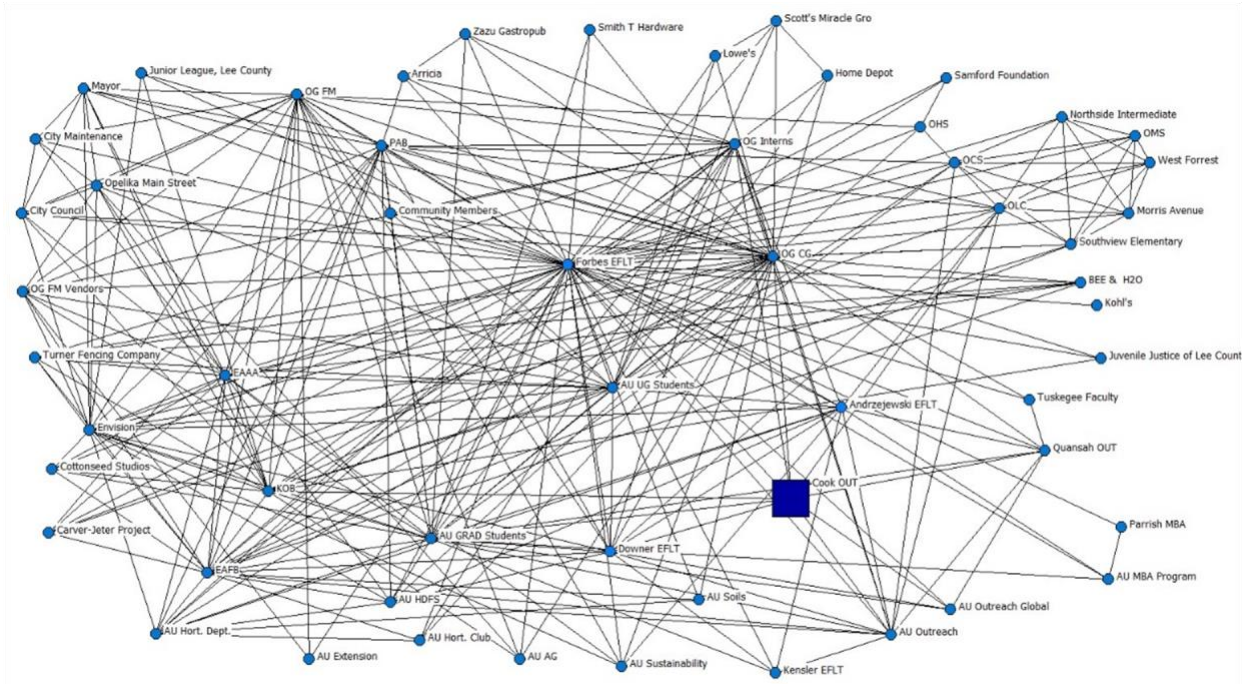
University Outreach, began funding the O Grows Intern Program, he became a significant actor in the OGCUEN. His engagement with the network started through the symbolic support he demonstrated for community youth in the partnership through a four-year COSG grant, but beyond that, his support signaled to others that the OGCUEN had merit. In addition to his support through Auburn University, Dr. Cook held a practical view of university outreach, which is often limited in both time and space, and supported the idea of engaging and embedding with a community because there is typically no endpoint for community engagement projects.

Dr. Cook is *of this community*—not only is he an institutional fit at Auburn University and an exemplary engagement champion for his work on behalf of the OGCUEN; he cares deeply about what happens around Auburn, and his funding demonstrates a commitment to young people through the OGCUEN.

Figure 8: Engagement Champion, Dr. Cook

Cook
Degree Centrality: 10
Betweenness Centrality: 3.048

In his boundary-spanner network, Dr. Cook is most internally aligned to Auburn actors with specific ties to the O Grows Interns project for his support of the program, facilitating broader awareness of the program and creating sustainability for interns.



Section Two: How Does Boundary-Spanning Behavior Influence a Community-University Engagement Network Over Time?

To answer this question, I transformed the ethnographic data I collected into a two-mode network (Borgatti et al., 2013), where nodes represent human or non-human actors and actions, activities, or events from 2012 to 2017, where the ties indicate participation by given actors. The relational composition of the network over time demonstrates the breadth of interactions that occurred between university and community actors during the collaborative community engagement process. These relational networks of actors and actions illustrate the ethnographic data collected about the OGCUEN partnership process over five academic years and include a

narrative overview of what was unfolding in the OGCUEN each academic year. I pair this information with measures of network characteristics such as university and community actors, number of activities, and the activities with the highest degree, where the degree is an indicator of the actors attached to the activity (Wasserman & Faust, 1994). Given the complexity of the community engagement process, change over time is demonstrated through a network composition of ties and actors, a narrative description of annual changes in the network, and empirical indicators of network changes over time.

Table 5: Network Characteristics of the O Grows CUEN

Network Characteristics of the O Grows CUEN				
	Active Nodes	**Active University Actors**	**Active Community Actors**	**Activities**
2012–2013	9	4	5	4
2013–2014	18	8	10	13
2014–2015	28	10	18	17
2015–2016	46	14	32	29
2016–2017	46	17	29	22

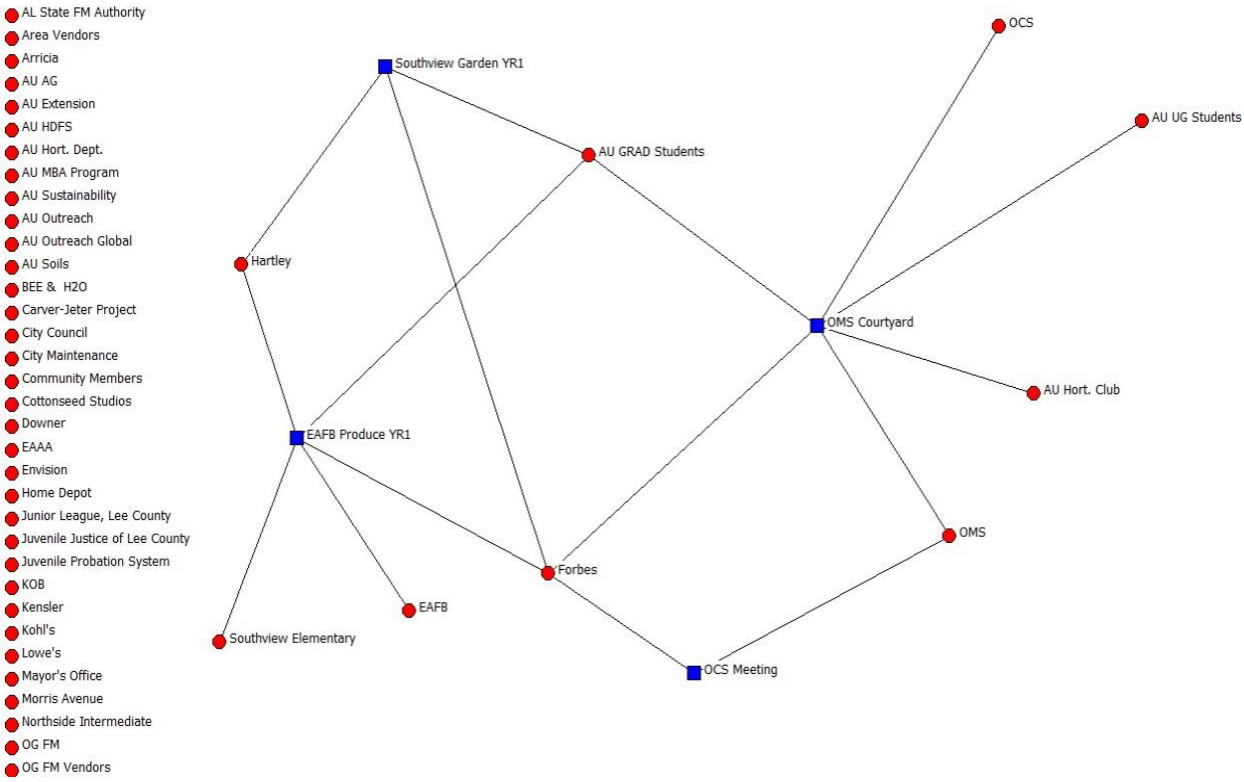
**To improve the readability of network change over time, I included all actors present in the network at any given time from Fall 2012 to Spring 2017 as nodes in each network, regardless of their participation level.*
The presence or absence of a listed node offers some consistency when reviewing network changes year to year.
The total possible number of nodes across all given years is 59.

Table 6: Activities by Academic Year with Highest Degree (Highest Connection to Actors)

Year	Activities by Year with Highest Degree (Highest Connection to Actors)							
	Degree	Activity(ies)	Degree	Activity(ies)	Degree	Activity(ies)	Degree	Activity(ies)
2012–2013	0.102	OMS Courtyard	0.085	EAFB Produce Donations	0.051	Southview Garden	0.034	OCS Meeting
2013–2014	0.237	Community Garden Year 1	0.153	K12 Site Support	0.119	EAFB Produce Donations & OCS Support	0.102	Northside Garden
2014–2015	0.271	Community Garden Year 2	0.220	Participant Advisory Board Recruiting	0.169	Turner Farm Start	0.153	K12 Support & EAFB Produce Donations
2015–2016	0.305	Farmer's Market Year 1 & Community Garden Year 3	0.254	USDA CFPP Submission 1	0.237	Participant Advisory Board Meetings	0.203	OG Vision Written & Zazu Produce Sales
2016–2017	0.339	Farmer's Market Year 2	0.322	USDA LFPP Submission 1	0.305	Community Garden Year 4	0.254	USDA CFPP Submission 2

Figure 9: O Grows CUEN, Academic Year 2012–2013

Active Nodes: 9	***Community Actors: 5***
University Actors: 4	***Activities: 4***

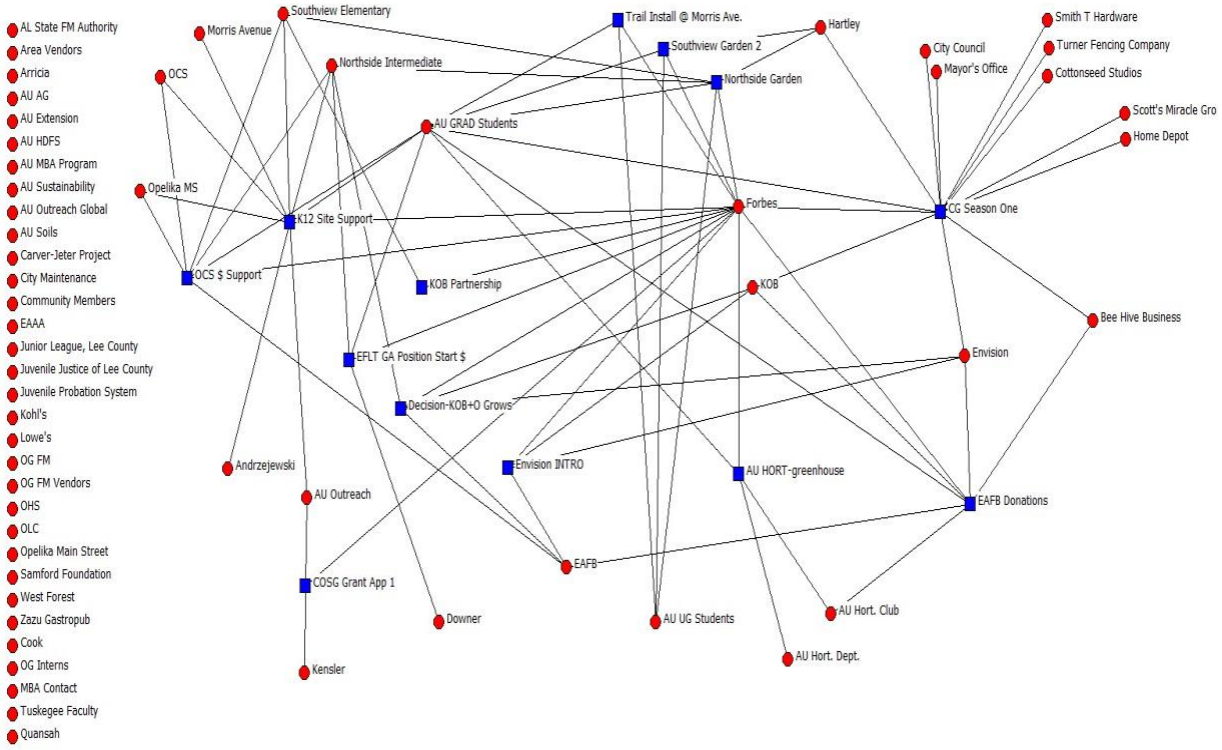


O Grows CUEN, Academic Year 2012–2013

The first ties of this network were social connections to observed need at a neighborhood school through work on a neglected garden. As a new member of the Opelika community, Dr. Forbes approached the school principal to discuss how to begin participating at the school. With help from other parents, he started working on the garden and saw how students responded positively to being outside and seeing where their food comes from. Then, Dr. Forbes began referring to his work in the community as Opelika Grows, ultimately called O Grows.

Figure 10: O Grows CUEN, Academic Year 2013–2014

Active Nodes: 18	***Community Actors: 10***
University Actors: 8	***Activities: 13***

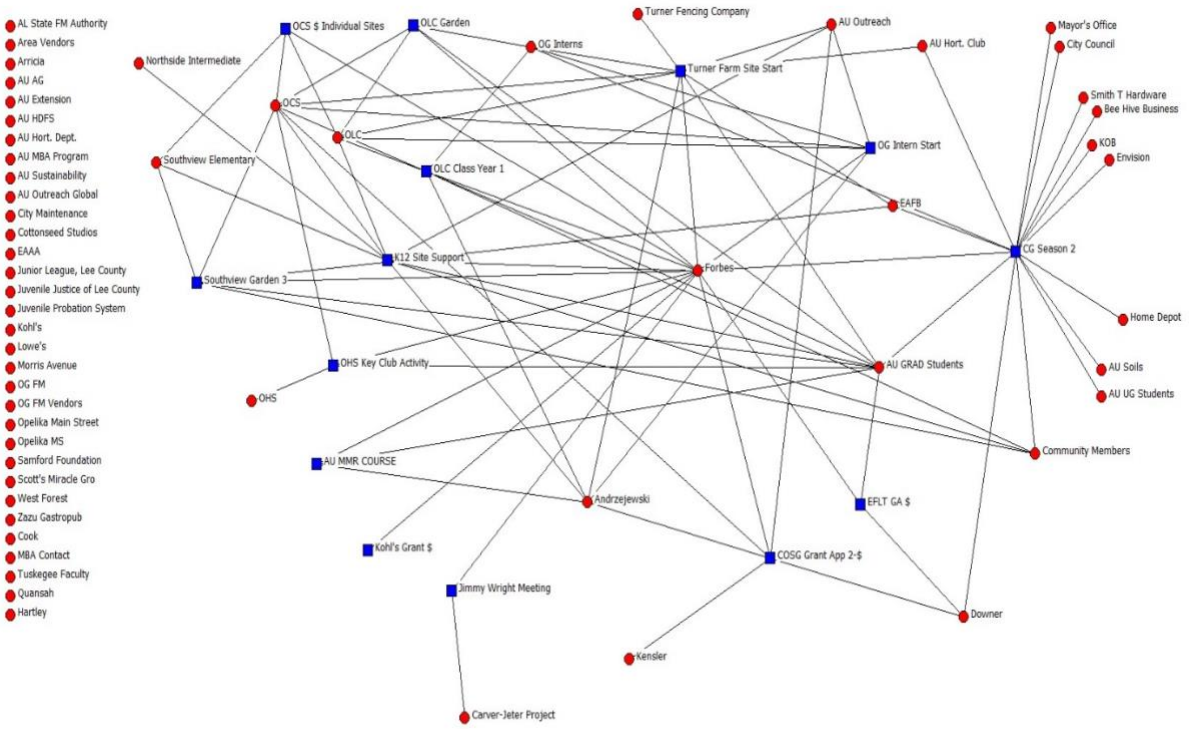


O Grows CUEN, Academic Year 2013–2014

In the second academic year, word of Dr. Forbes and his gardening students began to spread across the Opelika City school system and there was some incremental growth through community donations and connections to other community-based organizations with shared gardening missions, such as Keep Opelika Beautiful (KOB). The cooperation between Dr. Forbes and the community was based on his role as a citizen of Opelika, and his position at Auburn University was not considered a positive factor when he interacted with other community members. Indeed, many people he encountered were wary of partnerships with the university because of the local history between Opelika and Auburn. While working in schools across the community, Dr. Forbes learned about the lack of fresh produce available at the East Alabama Food Bank (EAFB) and began a program to donate garden produce to the Community Market, a grocery store where people pick up food distributed by the EAFB.

Figure 11: O Grows CUEN, Academic Year 2014–2015

Active Nodes: 28	***Community Actors: 18***
University Actors: 10	***Activities: 17***



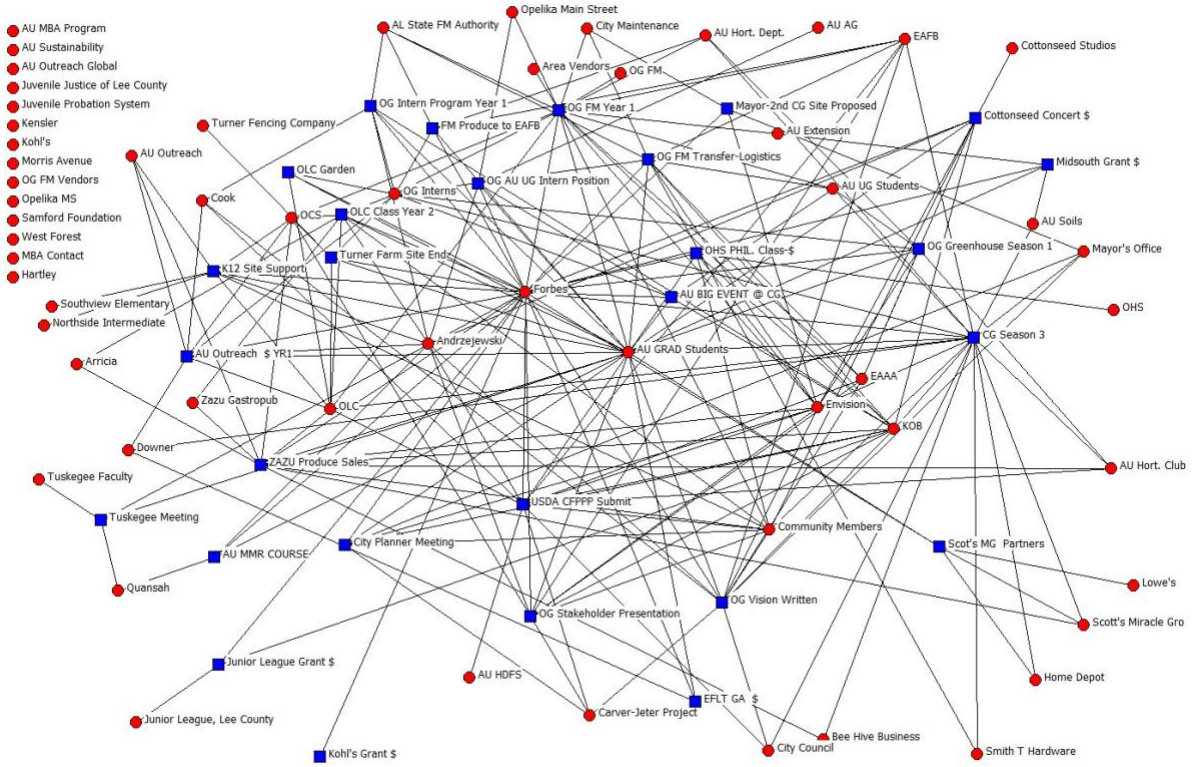
O Grows CUEN, Academic Year 2014–2015

Time spent in schools facilitated a partnership with the Opelika Learning Center (OLC), the alternative high school for students at Opelika City schools. Dr. Forbes worked with the principal to offer a hands-on class for students to build and maintain a school garden, adding cooking lessons from local chefs. Time spent with students was informative for Auburn faculty, and they created a proposal for an intern program for OLC students to work at the community and school gardens to earn money and gain practical skills.

During this year, the partnership between the university and Opelika began to take shape outside the school system when Dr. Forbes and KOB talked with the city about taking on a long-held wish for a community garden at a city building: the Southside Center for the Arts. Better known to Opelika citizens as the Brown School, it opened in 1929 and operated as such for more than 70 years in the historic Carver-Jeter neighborhood. The community-based organization Envision serves as the primary city property manager, and it had been seeking purposeful use of the unused land around the building. As a result of the garden installation, Envision and KOB noted the intersectional interests with O Grows and began discussions of how the group could work toward neighborhood revitalization, remaining aware of existing groups such as the Carver-Jeter Project and longstanding community institutions like Wright's Grocery. A larger O Grows vision focused on a community-based response around food security and social justice for the O Grows network began to emerge from meetings with Opelika citizens and community-based organizations.

Figure 12: O Grows CUEN, Academic Year 2015–2016

Active Nodes: 46	***Community Actors: 32***
University Actors: 14	***Activities: 29***



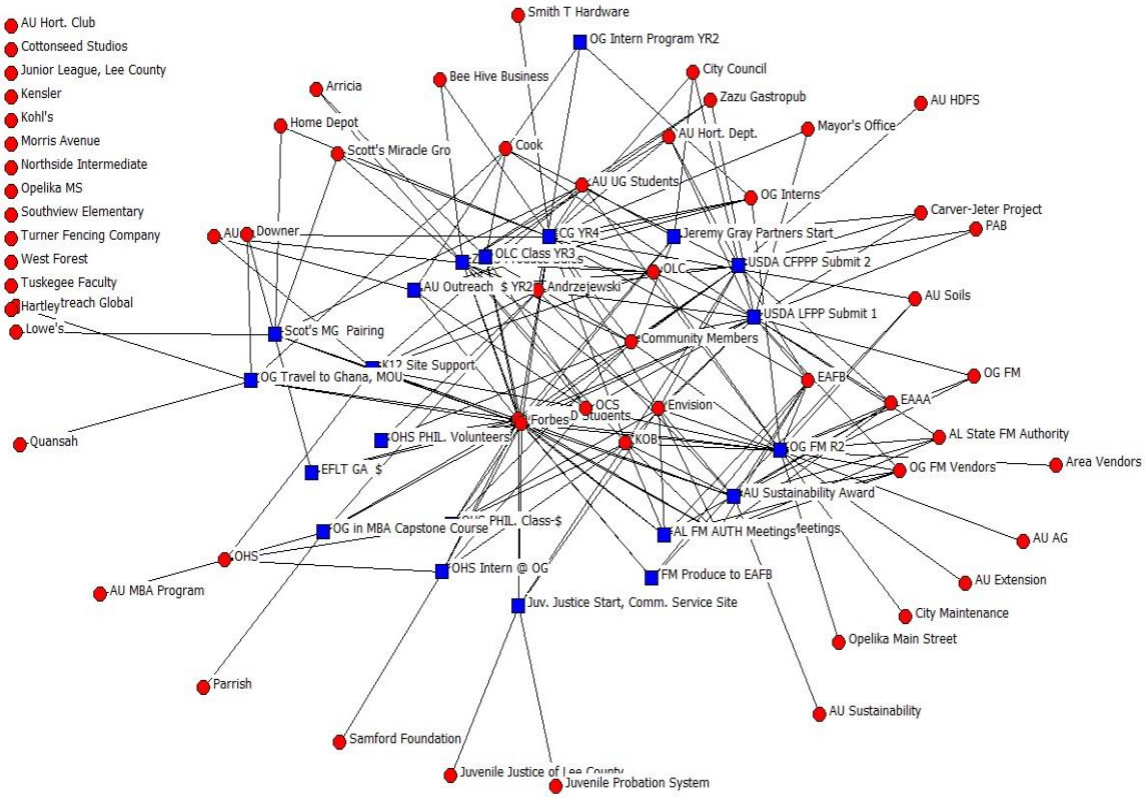
O Grows CUEN, Academic Year 2015–2016

Many of the emergent relationships and discussions developed into actions and events during this academic year and shifted O Grows into a more prominent role in the Opelika community. The garden class and O Grows Intern Program continued through OLC and reinforced the value of investing in systems that support citizens, reiterating the importance of community history and trust. A clear indicator of trust from other community-based organizations manifested when Opelika Main Street passed the management of the Opelika Farmers Market to O Grows; this transition unfolded over several months and embedded O Grows further in the community, with area vendors and farmers from across the state and region. During this transition, it became apparent that the O Grows network existed at the overlap of food security and had the ability to connect local food providers with a census-tract of many food insecure citizens.

With this realization, O Grows began an intentional adaptation to respond to the now-evident needs of the community. Together with community-based organizations and Opelika citizens, O Grows worked to create a Participant Advisory Board to oversee the development of a grant submission to the USDA Community Food Projects Program. The collective vision of the group included the creation of a community kitchen space in the Southside Center for the Arts, where people could pick up seasonal produce along with recipes and ingredients to prepare meals before taking everything home to feed their families. The proposal was a culmination of the early work between Opelika and Auburn University in the Carver-Jeter neighborhood.

Figure 13: O Grows CUEN, Academic Year 2016–2017

Active Nodes: 46	***Community Actors: 29***
University Actors: 17	***Activities: 22***



O Grows CUEN, Academic Year 2016–2017

The O Grows CUEN maintained the community garden, O Grows Intern Program, OLC class, O Grows Farmers Market, and developed deeper ties to local vendors and farmers as well as initial conversations with the Juvenile Justice System of Lee County. Network ties to Auburn University were bolstered during this academic year, and the engagements with food security and social justice began to emerge in the O Grows partnership.

Further, O Grows boundary-spanning faculty and graduate students traveled to the University of Cape Coast in Ghana with the Auburn Outreach Global program to establish a partnership between the two institutions. The O Grows CUEN was also nominated for and received an Auburn Sustainability Award. Finally, the College of Business included O Grows in the MBA Capstone course as a focus of a team competition, where five groups created comprehensive business and marketing plans for O Grows. Each of these activities offered a different platform through which to share the community engagement work with a broader audience and reinforced the reciprocal exchange between Opelika and Auburn University.

Continuous engagement with vendors and farmers throughout the year created a new dimension of awareness about the system-wide factors impacting food security at a local level, and O Grows continued the process of intentional adaptation to engage in this new partnership paradigm. As a result of these interactions, O Grows submitted an additional USDA grant proposal through the Local Food Projects Program to complement the Community Food Projects Program grant submission. The vision encapsulated in these grant proposals was emblematic of the continuous engagement process in which O Grows actors existed and worked, simultaneously carrying out ongoing projects while reshaping their understanding of the context in which they worked.

More than a desire to demonstrate the complex process of community engagement, it was these responsive collaborations that compelled me to embark on this methodologically-integrated study to find an investigative system with tools to convey these micro-dynamics beyond my own observations.

Regardless of the year, it is notable that the actions among university and community actors present a context-specific exchange of operational support in such a way that it is impossible to untangle any singular action, tie, or actor from the broader relational composition. In sum, the social capital and agency shared among institutional and community actors are both precursors to and results of the network structure. This intersection of community engagement, network theory, and network analysis demonstrates the complexity of exchange that unfolds over space and time when boundary spanners facilitate the reciprocal exchange espoused in Driscoll's (2008) operationalization.

Chapter Five: The Ties that Bind

Perhaps if provided a network visualization of what occurs between a university and its surrounding community, Davis (2016) would have garnered a more robust narrative on the partnerships that shifted the Brookings Institution-identified regions to outlier status. The *Wall Street Journal* article is just one instance of the unforeseen discussions by internal and external investigators regarding how communities interact with their university neighbors. The modern conception of community engagement has shifted the narrative on collaborations between universities and communities; however, translating this change to a broader audience necessitates a reconsideration of how we explore and make sense of the collaborative process. There is evidence of an internal shift through the faculty call for measures with more malleable indications of community engagement (Franz, 2012), but the process continues to evade categorization, resulting in the additional need for flexible, transdisciplinary research designs (Giles, 2008; O'Meara et al., 2011; Sandmann, 2008; Ward, 2003). The democratic perspective put forth by Saltmarsh, Hartley, and Clayton (2009) paints a picture of the process as a robust ecosystem of complex, reciprocal resource exchanges; in a similar paradigm, Anderson et al. (2019) speak to a dynamic tension of interaction during community engagement.

Thus, community engagement research through a pragmatic paradigm should include relational perspectives from multiple disciplines. This approach facilitates the consideration of influential factors such as community and university context, social capital, institutional support, available resources, behaviors of actors, and other unanticipated factors. Across the relevant literature, many studies embrace the same relational perspective, serving as a reminder of the flexibility of applications across contexts and its ongoing relevance for future investigations of community engagement. Moreover, modern studies of community engagement must assume that

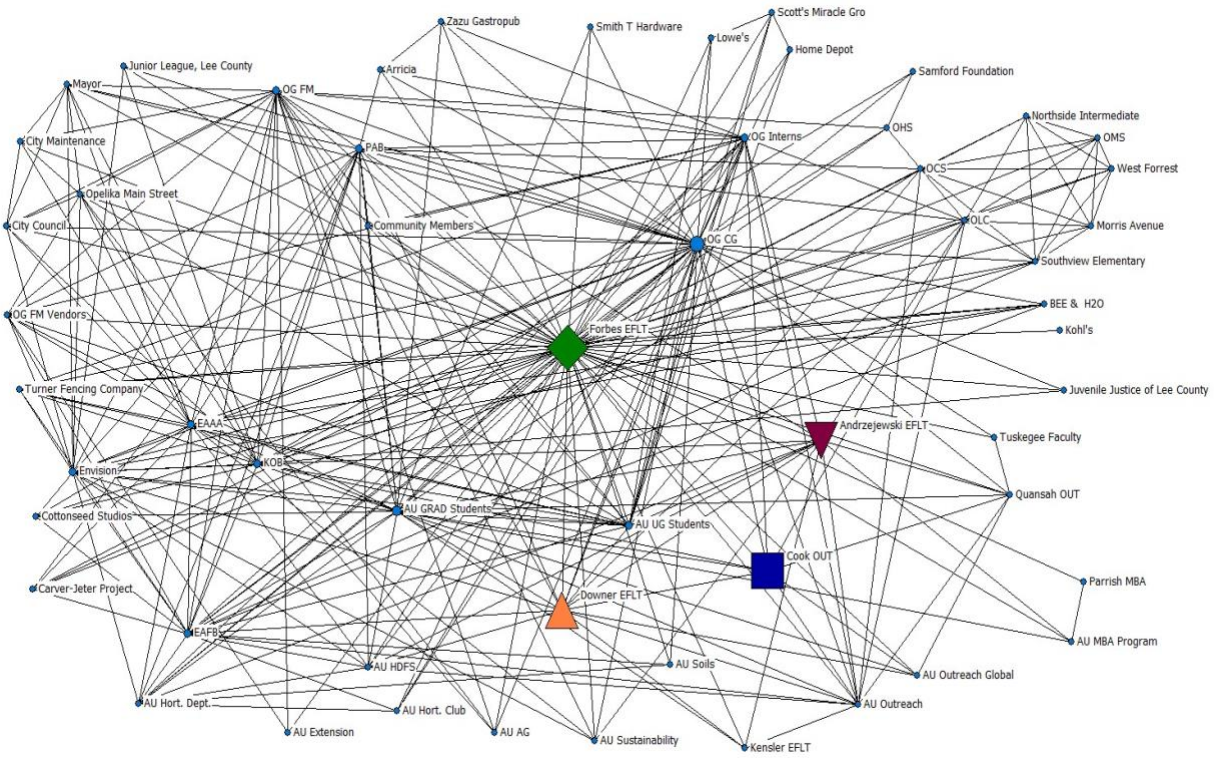
a community has value beyond receiving knowledge. This shift would employ democratic and varied perspectives, create space to visualize the process, demonstrate change through intentional adaptation, reveal evidence of transformative collaboration, and account for nontraditional university professionals as negotiators of this process. The vision of the complementary whole (Johnson & Onwuegbuzie, 2004) provides for a complex reality, disregards the notion of absolute Truth, regards the application of theories as instrumental, asserts the value of democratic notions, and assumes there are multiple avenues for knowledge accumulation (Johnson & Gray, 2010).

The purpose of this study was to apply network analysis to visualize and explore the collaborative process of community engagement, with a focus on the ties created by boundary-spanner professionals and the network change process in response to community actors. An exploratory mixed methods research design included my ethnographic data, made up of narrative and numerical information that I transformed into relational data. To bolster this presentation, I synthesized constructs from community development, network theory, community engagement, social capital, and network analysis to visualize the community-university engagement network of O Grows. This synthesis of disciplinary constructs provided a framework upon which to apply a novel perspective to the visualization of community engagement collaborations, where network analysis demonstrated contextual elements of the partnership process among university and community actors. Part of this literature integration required identifying a paradigmatic perspective that could account for divergent disciplinary research constructs and methods; through the complementary whole, I found the pragmatic context whereby this study would reside, and this concluding chapter reviews the findings and discusses its implications.

Review of Findings

Before reviewing the findings of the research questions, it is helpful to revisit the design considerations and discuss a few broad observations I made about the relational composition of the OGCUEN during the study. To answer the questions in this study, I first visualized the composite network of actors and ties formed during the community engagement process between Opelika and Auburn University. Below is a composite network snapshot that conveys the interconnected characteristics of the community engagement process among community and university actors in the formation of the OGCUEN. It is a composite visualization of all known connections from a one-mode matrix as actor-to-actor ties and illustrates a significant amount of information in one crowded figure, a design choice I will explain later in this section. After many iterations of spatializing data from this study, I selected this busy visualization to indicate that community engagement is a unique, context-specific process that necessitates a pragmatic toolkit to explore the process adequately.

Figure 14: Snapshot of the O Grows CUEN (2017)



The lines indicate the presence of a tie between actors (representing some level of agency flowing between them, e.g., conversation, meeting, working together on a project, access to resources, support on a committee), demonstrating all known interactions in the O Grows network. Actors named in this network are not only individuals; it includes a "distribution of actors, relations, and agency" (Decuypere, 2020, p. 76) to capture any entity that exerts agency over another. The goal of this network snapshot is to explore the level of *practice* (Decuypere, 2020) of "partnership and reciprocity" (Driscoll, 2008, p. 39) through a democratic lens that acknowledges the agency of community actors in the community engagement process by placing them alongside university boundary spanners.

If the network analysis were limited to boundary-spanning behavior, it would not capture the ties established among other actors outside their primary relationships. Ties exist between myriad actors in the network; some began before the boundary spanners started collaborating with the community, and some ties resulted from boundary-spanning behavior. Novel ties through boundary spanners are especially true for Auburn students (both graduate and undergraduate) and the O Grows Interns; when new students and interns join the OGCUEN, they frequently work with Dr. Forbes and his graduate students to learn about the garden and community partnerships. As they become acclimated to the work and develop relationships, the O Grows Interns create work and personal connections with other actors and are trusted to carry out tasks on behalf of Dr. Forbes. Similarly, Dr. Forbes often connects his graduate students with other university and community actors in the network, and then graduate students directly carry out tasks and projects with community members, gaining experience and insight through the network ties.

The extent of ties among actors also reveals a careful design choice I made during the early phases of generation and transformation that was contingent on several factors. The first

consideration relies upon the *relationalism* espoused by Decuypere; my goal was to include "each and every entity that is capable of exerting some agency upon others" because "networks are methods that assist in giving an account of a particular practice under investigation" (2020, p. 76). Within this perspective, I included the observable data generated through ethnographic practice but also added relational ties for social capital elements: the flow of information, influence and power, social credentials, and reinforcements of access to resources or other entitlements (Lin, 1999) because sometimes the social capital in a network is not exerted through overt actions.

I also found utility in the rationale of Venturini et al. that visually ambiguous relational data improve exploratory data review, and any removal of data would result in "*reduction to exactitude*" (2021, p. 8) and preemptively diminish the observational opportunities in the data set. Each iteration of data spatialization presents an opportunity to make sense of the relational information and consider alternative presentations of the data to clarify or expand my perspective. These assertions hold true for the second question, maintain the pragmatic lens of the complementary whole, and support the conclusions of this study.

Review of Section One

The first question, "How do boundary spanners create community-university engagement networks?" relied on one-mode data to demonstrate the ties boundary spanners formed among actors. To focus on the early years of the OGCUEN, I selected one exemplar from each boundary-spanner role to examine closely through descriptive and network perspectives, including multiple data points to inform my exploration of the boundary spanners. The inclusion of multiple data presentations (network composition, network measures, and descriptive data) reflects the complexity of community engagement partnerships and creates a more robust picture of boundary-spanning behavior.

Table 7: Boundary-Spanner Roles (Weerts & Sandmann, 2010)

	Broad description of observable actions	General level of interaction
Community-based problem solver *FORBES*	Lead transformational community change; work on solving problems and acquiring resources; negotiate expectations and break down barriers	Development and management of partnerships
Technical expert *ANDRZEJEWSKI*	Possess significant disciplinary expertise and contribute as a content expert and researcher; tend to be more closely aligned with the institution	Engage with partnerships in an expert capacity
Internal engagement advocate *DOWNER*	Serve as leaders or in leadership-support roles such that they can facilitate infrastructure creation for engagement; lend credibility and commitment to any partnership	Participate in the partnership by creating internal structures and shifting the institutional culture to perpetuate ties
Engagement champion *COOK*	Most likely to be situated in high leadership roles where their participation represents strategic and symbolic support for the partnership; often heavily focused on fundraising and political action that bolsters alliances	More than rhetorical participation; capable of bringing about organizational change and can shift institutional culture

How size and degree are applied varies by researcher and use results from study assumptions of what each measure represents; degree centrality is a count of the number of ties an actor has, and betweenness centrality indicates how often an actor lands on a route between any two other actors. For example, to measure the growth of a university-community collaboration, Woolcott and Chamberlain (2019) first count the number of participants present at 40 meetings throughout the course of a project and calculate the average degree of meeting participation for each participant. The authors also utilize degree centrality (ranging from zero—where all actors are connected—to one—a single member is the lone connection for all actors) to compare the primary leaders to the whole network and determine how network connections changed over time.

The rationale for and interpretation of these measures and relevance to the level of *practice* (Decuypere, 2020) are as integral as the data derived from the measures; the interpretation of measures in this project is not as straightforward as Woolcott and Chamberlain's study. Measures in this study are worth considering but also demonstrate the importance of mixed methods and

context to explore a community-university engagement network; regarding the first question, measures of centrality alone do not sufficiently demonstrate the behaviors of boundary-spanner roles in a community engagement collaboration.

Table 8: Section One Network Measures

	Relational Descriptors			Network Measures, 2017	
	Boundary-Spanner Role	**Job Title in 2017**	**Initial Entry into Network**	**Degree Centrality**	**Betweenness Centrality**
Forbes	Community-based problem solver	Associate Professor, EFLT	School garden in Opelika	58	814.688
Andrzejewski	Technical expert	Associate Professor, EFLT	K12 support with Forbes	15	13.256
Downer	Internal engagement advocate	Department Head, EFLT	GA position funding	16	9.863
Cook	Engagement champion	Associate Provost and V.P. for University Outreach	Funding for OG Interns	10	3.048
**EFLT is the Department of Educational Foundations, Leadership, & Technology in the College of Education*					

Dr. Forbes's degree centrality was 58, indicating his connection to all 58 actors in the network. His betweenness centrality was 814.688, a high value that demonstrates his location between multiple other actors and aligns with his primary role from the inception of the partnership. These values reflect his central role from the outset of the OGCUEN. However, it is also helpful to consider his work across the institution to bring in additional Auburn University faculty, students, and programs from outside the College of Education and provide them with engagement opportunities. The network illustrates his thoughtful recruitment and continuous engagement with existing and novel individuals and groups that were essential to the formation of the OGCUEN, revealing his high value. As a community-based problem solver, centrality measures for Dr. Forbes are the most straightforward since his role entails significant interaction with other actors in the

network. Centrality measures for the remaining boundary-spanner roles are less clear because their community engagement tasks are not as reliant on relational ties with community actors.

As a technical expert, Dr. Andrzejewski had the second highest number of ties to community actors, with a degree centrality of 15 and a betweenness centrality of 13.256. It makes sense that her role had the second highest centrality (13.265) because, in addition to the PAB, federal grants, IRB, and YPAR, she created links between the institution and the community. As the project progressed, Dr. Andrzejewski drew upon her nuanced understanding of O Grows to identify and facilitate recognition for the network, bolstering visibility and increasing project awareness.

Similarly, Downer's second highest degree centrality (16) and betweenness centrality (9.863) reveal the parameters of her role as an internal engagement advocate. Her position as Department Head of EFLT led to her direct contact with university actors in the OGCUEN. Further, she made decisions about the allocation of funds that would directly support the sustainability of the collaborative network.

Finally, though Dr. Cook's degree centrality (10) and betweenness centrality (3.048) are lower, the importance of his role in the network is evident through both visible, symbolic support and financial engagement. His institutional role established financial sustainability and bolstered the narrative that O Grows holds intrinsic value for the university through community engagement collaboration.

The network structure of the OGCUEN contained 59 actors in the 2016–2017 data for this study: 40 are community actors, and 19 are from the university. Weerts and Sandmann (2010) identified these four boundary spanners as typically working within the university to support community engagement efforts; therefore, they are more likely to be tied to fewer actors and hold lower centrality in the network.

Additional considerations of boundary-spanner roles

In assumptions of boundary-spanning behavior, Weerts and Sandmann (2010) offer several clarifications for their proposed application of boundary-spanner roles that represent the complementary whole paradigm (Johnson & Onwuegbuzie, 2004). First, the boundary-spanner roles are not mutually exclusive or static, and it is assumed that individuals will carry out actions that could fall into multiple categories, a belief that "rejects dichotomous either-or thinking" (p. 88) and recognizes the instrumentality of theories. Second, an inherent and often unobserved reliance on others in the institution must exist for the community engagement process to work effectively, a perspective that rests squarely with the role of the complementary whole's person-environment interaction. Third, the authors posit that the success of community engagement might be predicated on the harmonious interaction of all roles (community-based problem solvers, technical experts, internal engagement advocates, engagement champions) to foster effective community engagement. This constellation of observed and invisible actors that unite to establish an effective network of community engagement necessitates an "an ontological position of pluralism" (Johnson & Onwuegbuzie, 2004, p. 88) to reconcile the complexity of how known and unknown individuals affect the observed community engagement process that occurs between a community and university.

Finally, Weerts and Sandmann propose that some boundary spanners might act as a composite entity, bonding themselves together in the network, or even hold all roles and exist as "composite entities that subsume multiple types of relationships with external agents" (p. 651) through the community engagement process. This final clarification illustrates the inherent complexity of community engagement, where measures of centrality do not adequately demonstrate the comprehensive behavior patterns of these boundary spanners; instead, they suggest the value of

utilizing relational analysis derived from narrative ethnographic data to explore the process of community engagement through mixed methods.

Review of Section Two

The second question, "How does boundary-spanning behavior affect a community-university engagement network over time?", utilized two-mode data to depict which actors took part in boundary-spanning activities over five academic years and included network characteristics and narrative descriptions of the OGCUEN each year. The most apparent conclusion from this section is that the network grew in community actors, university actors, and activities wherever, but the number of community actors was always higher than university actors. In this section, degree centrality indicates which activities connect to the highest number of actors, and the results are consistent with the intentional adaptation of the community engagement process. Regarding the timeline, the primary activity in 2012–2013 was at a school; in 2013–2014 and 2014–2015, it was the community garden; 2015–2016 had a tie for primary activities, the community garden and the first year of the farmer's market; and finally, during 2016–2017, the primary activity was the farmer's market. Boundary spanners facilitated each of these activities, which resulted from community input and support; in short, growth in the network is representative of this work.

In any network, all actors are capable of exerting agency over others in such a way that the composition of the network will transmute over space and time (Decuypere, 2020); that is, all actors in a network influence others which may lead to structural changes. This assertion that all actors can impact others in the network is a decidedly democratic notion aligned with the perspective of the complementary whole (Johnson & Onwuegbuzie, 2004). Because it assumes reciprocity of influence, it is similarly aligned with the modern conception of community

engagement and further demonstrates the valuable intersection of network theory and community engagement.

Specifically, this study focused on boundary-spanning actions as they perpetuate community engagement in reciprocity and exchange (DePrince & DiEnno, 2019; Driscoll, 2008); to adequately explore this process, a methodology should account for the agency of both community and university actors to demonstrate how this exchange happens. By depicting changes in the OGCUEN over time, snapshots of network structure from 2012 to 2017 place community actors alongside university actors as an indicator of the agency community actors hold in this partnership. There is an important distinction here: though the focus of this study is on university boundary spanners, there are no assumptions that these boundary spanners could do any work without community support, and even when not explicitly stated, this study recognizes the prominent influence of the community in the community engagement process. The shift of network composition over time is what makes each network unique (Decuypere, 2020), and narrative and relational composition in this case study demonstrates the reciprocal exchange (DePrince & DiEnno, 2019; Driscoll, 2008) in community collaborations that are *of the community*, not just in the community.

Implications

This study was my answer to the call from O'Meara et al. to explore community engagement using "studies, frameworks, and methods that weave together an examination of different sectors of faculty work, theories from multiple areas in social science and other areas of inquiry, and a diverse set of research methods" (2011, p. 85). To accomplish this goal, I synthesized relational perspectives from community engagement with network analysis to prioritize a democratic perspective of community engagement that captures the complexity of a process that relies on

collaboration from university *and* community actors to proffer evidence of mutuality (Anderson et al., 2019). The value of this work emerges from its integrated theoretical framework and the creation of the phrase *community-university engagement network* for a novel examination of the process that unfolds between university boundary spanners and community actors. Predicated on the complementary whole, the strategies outlined in this study proffer a pragmatic toolkit for further exploration of community-university engagement networks as they exist in context.

The purpose of including OGCUEN data was to convey the practical application of this relational analysis to an existing community engagement collaboration and clarify the alignment between the espoused theoretical framework and the research design. Materials presented within these chapters are limited to a single case study, but even small studies of networks can offer insights into the connections among the structures and experiences of individuals and organizations (Balfour & Alter, 2016; Clark, 2007; Granovetter, 1973, 1988) and inform ongoing research on community engagement partnerships.

Revisiting institutional norms of community engagement

Beyond utilizing this design to explore the nature of the community engagement process in the given context, this study presents an opportunity to revisit the lagging paradigm shift between the *practice* of community engagement that exists in the space between the community and the university. Thus, it challenges the institutional expectations of how this practice creates scholarly and promotional justifications for the dominance of the professional class. That is, most institutional indices of faculty and professional practice remain entrenched in a positivist culture (Saltmarsh, Hartley, & Clayton, 2009) that insufficiently acknowledges and demonstrates the modern practice of community engagement as described in this study (DePrince & DiEnno, 2019; Driscoll, 2008). Similar scholarly expectations cannot adequately capture the complexity of such

partnerships, as demonstrated here. Failures occur even where well-meaning partnerships review the collaboration based on an epistemology that "is firmly entrenched as the operating system of much of the American university" (Sullivan, 2000, p. 29) because it conflicts with an egalitarian view based on reciprocal exchange. Thus, investigations of partnerships predicated on relational perspectives of community engagement might better address the discrepancy between community engagement practices and the institutional expectations based on outmoded historical conceptions of these partnerships.

Studies must move beyond a narrative examination of community engagement to embrace the full context of community-university engagement through adaptive models and boundary-spanning roles (Stephenson, 2011; Weerts & Sandmann, 2010). Consequently, there is an impetus for a research methodology with the capability to capture context-specific boundary-spanning experiences while acknowledging the role of less visible actors, presenting a comprehensive picture of the "mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity" (Driscoll, 2008, p. 39) by placing community actors alongside their university counterparts. Thus, explorations of the community-university engagement network created by boundary-spanning actors in active collaboration with community actors will demonstrate the partnerships and bolster our understanding of the relational dynamics that promote reciprocal exchange. Research with a more in-depth approach uses network analysis as an evaluation tool and asserts that community engagement is contingent on relationships *and* genuine partnerships with long-standing connections fostered through awareness of and respect for all involved (Baquet, 2012; Bright et al., 2017).

The actions of boundary-spanning individuals perpetuate the ties that create and maintain dedicated space beyond the centralized structure of the university, wherein community-university

collaborations are founded on a democratic balance of involvement and resources to benefit the interests of all network actors. Specific individuals can bridge relationships and span network boundaries, acting as microcosms through which community and university actors identify and prioritize their perceived intersectional interests to strengthen and sustain their community-university engagement network. To create a reciprocal community-university partnership with mutuality (Anderson et al., 2019), these actors need to foster interactions that allow for an exchange of resources. Within and across these ties, network structure is not static; rather, the iterative, dynamic tension between university and community actors facilitates reciprocal, productive collaboration, likely resulting in structural change within the network to reflect the intentional adaptation of the evolving partnership.

Limitations of the Study

Because this study adopts a novel methodology and uses a single case study, I expect to find areas to improve the methodological application immediately. Additional limitations include the time and energy it took to manage data, establish an understanding of the OGCUEN, and keep up with changes over time. Initial data generation required time from the boundary-spanner faculty, who had to provide descriptions for activities where I was not present and create exhaustive lists of actors who shared resources; recall is also a limitation, as is knowledge of less overt social capital influences that flow throughout the network. Data transformation included iterations of trial and error where mistakes could affect any phase of transformation, so maintaining an accurate primary data source and subsequent iterations of data was cumbersome at times. Finally, though it would be useful for additional applications of this design, this study does not use data to make assertions about the effectiveness of the CUEN based on observations of boundary-spanning behavior and network change over time.

Reflections on the Study Design: Networks

Within this exploratory mixed methods design, there were notable considerations from existing scholarship that are included here as methodological considerations for future community engagement research based on relational perspectives, network analysis, boundary spanners, and community-university engagement networks. First, it is imperative to recognize the flexible application of both network theory and analysis, where researcher assumptions influence their use within a study. During my literature review, I noted several assumptions about networks that influenced decisions in this study:

1. Generated data provides a system to study ties created by boundary-spanning behavior, where relational data and networks change over time, resulting in characteristics specific to particular networks (Decuypere, 2020, p. 76).
2. In various research designs, network theory remains useful as "a framework for interpreting patterns of interactions" (Woolcott & Chamberlain, 2019, p. 20).
3. Commonly attributed to mathematical origins, Contandriopoulos et al. (2018) note that network analysis was simply a tool to unify elements after early accounts found that results deviated from studies of a given phenomenon that focused only on individual actions and attributes.
4. Moreover, "networks are not only mathematical but also visual objects," where the "network space is a consequence and not a condition of" (Venturini et al., 2021, pp. 1, 3) ties among actors.
5. Networks are "methods that assist in giving an account of a particular practice under investigation" (Decuypere, 2020, p. 76).
6. Some have described the *network* as "a method that allows to trace the complex entanglements by means of which specific practices are constituted" to "come to an

integrated understanding of the relational composition of a particular practice under investigation and of the effects that these compositions generate" (Decuypere, 2020, p. 74).

Second, these assumptions subsequently informed my decisions about the concurrent phases of data generation and transformation, where I encountered a wealth of expansive and complex information. I found insight from Venturini et al. (2021) about commonly held negative perceptions that complex network data are ambiguous. Instead of finding only ambiguity in complex network data, the authors assert it is an opportunity to better understand a given practice through data exploration. Throughout these phases, I discovered that in addition to expected measures of network structure, there was also a novel perspective of network data that "conceives of networks as tools that enable to *present* (rather than represent) how a practice is relationally composed" (Decuypere, 2020, p. 76). Therefore, the iterative, concurrent phases of data generation and transformation were necessary to determine whether the relational data presented a network that accurately represented how the narrative and numerical data are "relationally composed" (Decuypere, 2020, p. 76) within the OGCUEN.

Finally, there was a discordant tone to the concurrent phases of generation and transformation as I attempted to reconcile my instinct to create order within the pragmatic complementary whole. I began with the assumption that visually ambiguous diagrams are, in fact, an asset for exploratory data analysis and the iterative sense-making process when managing qualitative data sets (Venturini et al., 2021). Further, since all actors in a network can exert agency over others (Decuypere, 2020), it was necessary to maintain the complexity of relational data in the network as a reflection of the reciprocal, egalitarian values espoused in community engagement (DePrince & DiEnno, 2019; Driscoll, 2008) and the complementary whole (Johnson & Gray, 2010). Ultimately, the concurrent data generation and transformation were crucial to the internal

consistency of this study because the iterative process forced me to acknowledge my subconscious drive to create a visually clear narrative of the OGCUEN by eliminating data I perceived to be insignificant. Venturini et al. refer to this as a "*reduction to exactitude*," where "efforts to *clean up the picture* risk to *cut* observation along precise but fallacious lines" (2021, p. 8). The discussions following my initial instinct to "*clean up the picture*" reinforced the relevance of the complementary whole's pluralistic reality and the importance of "warranted assertions" over a claim of Truth (Johnson & Gray, 2010) in research on the modern community engagement process.

Reflections on the Study Design: Boundary Spanners

The questions in this study focus on actors who embrace boundary-spanning behavior to create ties within (bonding capital) and outside (bridging capital) their network, and the desired tie is dependent on the actions of the boundary spanner. As discussed in the literature review, scholars typically identify social capital in a network as bridging capital through structural holes (Burt, 2000, 2004) or social closure in a network (Coleman, 1988) as bonding capital. The role of structural holes (bridging capital) and boundary spanners has been identified as a factor in university-community collaboration focused on knowledge co-creation and active participation across community and university partners. One such study links network structure to engagement function, where Woolcott and Chamberlain (2019) seek an increased information flow that requires a decentralized network, so they consider weak ties and structural holes a vital characteristic of project sustainability. At the time of this study, there were not any network analyses specific to boundary spanners in community engagement; based on the roles articulated by Weerts and Sandmann (2010), whether bonding or bridging capital is most important in a network would likely vary depending on the behavior of a boundary spanner in the CUEN.

The role of boundary spanners in a community-university engagement network is foundational to the collaborative process between an institution and community. However, the mere presence of these actors in a CUEN is not an adequate demonstration of the reciprocal exchange that classifies a community engagement partnership as being *of the community*. To bolster the proposition that a partnership is *of the community*, it is helpful to revisit an assumption about network characteristics through the assertion that "network forms might transmute over time, but equally that the very constitution of this form is what provides particular networks their specificity" (Decuypere, 2020, p. 76). Thus, it is possible that the specificity demonstrated in a longitudinal exploration of a community-university engagement network could offer evidence of reciprocal exchange and intentional adaptation, where university actors remain responsive to the community's needs over time.

Final Comments

Through my extensive literature review, I realized that researchers generally embrace the practical application of network analysis across diverse disciplinary applications. Many studies cite network analysis as a valuable tool to visualize the invisible systems and institutional norms that actors navigate to collaborate across organizations. One such study by Ware (2017) articulates the value of studying interorganizational networks that support youth employment because "social networks and relationships, as well as the capacity to create them, are essential for tapping into and fully realizing the potential of a community's richness" (p. 1). Another study expands on how a network map would allow groups to make decisions about their network resources. The authors state that "evidence of the nature of ties, how strong they are, with limited resources, allows network members to be strategic in strengthening connections" (Provan et al., 2005, p. 606). Consequently, individuals in networks can also "identify trust and collaboration, track progress,

accomplishments, and see the whole network and manage expectations" (pp. 610–611). This approach will allow them to "make sense of systems in a community that will demonstrate the process to other communities who may be asking the same questions" (p. 606).

In many ways, the literature I reviewed for this study formed a meta-network of theoretical and disciplinary ties with cross-cutting author perspectives and study designs holding similar assumptions across time and disciplines. Similar to the complexity of the community engagement process, I found it exceptionally difficult to make clear the invisible connections that logically exist to convey the breadth of utility and applicability. Nevertheless, this study represents an initial exploration into the behavior of boundary-spanner professionals through network analysis; it appears the possible applications are as expansive as the perspectives found in this study.

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