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Care Systems in Community-Based Contexts: The Role of Navigation and Technology in Promoting

Access to Human Services in a Referral Network

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Abstract

The provision of social services is becoming increasingly complex as human service agencies, nonprofits, and government agencies recognize the importance of wraparound care. A wraparound approach to social service provision acknowledges the importance of providing comprehensive services that meet various needs of an individual, family, and community. This approach is enacted through systems of care. Systems of care are interorganizational referral networks that use technology and personnel to coordinate care and mobilize resources. This dissertation explores how community-based systems of care use technology and navigation services to support care provision. It uses theoretical frameworks from community development, ecology, community psychology, and technology design to answer three research questions: 1) how do community-based network members perceive or characterize case management technology use in collaboration?; 2) how does the use of case management technology by community-based organizations mediate access and connection to care?; and 3) how do community navigators in community-based systems of care influence access to care? Research question 1 uses a mixed-method approach. It examines how community-based members understand and conceptualize case management technology tools concerning care system work and the potential for different use categories to appear. Using semi-structured interviews with 13 care system personnel and examining 467 service episode data from the IRIS case management system, this research finds that the community-based care system sees variation across metrics that point to the provision of care (time to accept, time to close distribution of referrals). Computing these metrics highlights different user categories. Specifically, care system backbone personnel and affiliates (senders) are responsible for routing most service requests. Combinatorially, this difference in use surfaces qualitatively as community-based partners

(receivers) point to a reliance on backbone staff as the primary routers of service requests. Although there is uneven use of the case management technology, both partners and backbone personnel show that case management technology affords the ability to build community relationships and capacity. These technologies support community connection and resilience that extends past the technologies themselves. These findings expand theoretical explanations surrounding the affordances that case management technologies provide.

Research question 2 is descriptively driven and examines the outputs of using these technologies. Specifically, this research question emphasizes care system process metrics like time to accept, rejection rate, time to close by service type, and organization. An examination of 467 service episodes from IRIS finds significant variation in process metrics across service type categories and organizations. These findings suggest that service complexity and service ambiguity influence how community-based organizations provide care.

Research question 3 examines how community navigators influence community members' access to services. Through a grounded qualitative approach of interview data from 13 care system personnel, this dissertation finds that community navigators also serve as community resource advocates and consensus builders. The community resource advocate role emphasizes local use of community resources. The consensus builder role underlines the ability of a community navigator to create buy-in and awareness across care system stakeholders to ensure a community member's care-seeking journey is comprehensively supported.

Overall, this dissertation provides five key contributions. First, it offers a detailed empirical observation of ecological system theory by explaining how care systems embody the mesosystem and the exosystem. This dissertation expands our understanding of technologies'

active role in our development. Specifically, technologies can comprise complex systems of

relationships and interactions. Technologies mediate our experiences with others and are co-

constitutive. Second, this work extends our theoretical understanding of technological affordance

by surfacing a different use category that may be relevant as case management technologies

move to community-based contexts. Third, this work provides a typology that expands our

understanding of the roles community navigators play that are unique from their counterparts.

Fourth, this work serves as a resource and guide to scholars and community-based organizations

to fully embrace the potential of technology and community navigators as modes to create social

impact and support equitable community development. Finally, this work provides propositions

for further research to expand and test the presented results.

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CHAPTER 1: INTRODUCTION

COVID-19 raised our collective consciousness surrounding the intersecting crises within and across communities. This once-in-a-lifetime phenomenon laid bare disparities in education, health, income, and civic participation that have always existed but are now amplified (Mein, 2020; Treadwell, 2020). This awareness goes hand in hand with the socio-ecological view of health determinants. This view assumes that organizations must collectively support and address various needs to increase outcomes through comprehensive interventions (Marmot & Allen, 2014). Increasingly, organizations are working together to address these disparities and are using a system of care (SoC) approach as the primary solution (Bunger & Huang, 2019).

SoCs are integrated health and human service networks across health and human service agencies. Traditionally, this approach is seen within and across hospitals and health providers. These clinical care systems, often seen in oncology, geriatrics, prenatal and postpartum care, provide wraparound services to patients needing care after their initial hospital visit or a significant health event (Jacobs et al., 2007; Shellhaas et al., 2016; Stout et al., 2019). Wraparound care is a philosophy that describes the act of families, practitioners, and community stakeholders coming together to collaborate and implement services and interventions for development (Burns & Goldman, 1999). This approach allows health providers to share information about clinical statuses through electronic medical record systems, serving as a referral technology for patients to complementary medical departments or agencies (Wasserman, 2011). Sharing information and connecting patients decreases the likelihood of adverse health outcomes due to ongoing support for patients (Clark et al., 2013). Patient navigators assist in coordinating communication between providers and clients, often seen as the primary mediator of care (Phillips et al., 2014). Due to the ability to streamline various activities, SoCs are shifting

into different environments that are more community-driven and comprehensive in the scope of needs and interventions (Gibbons & Samaddar, 2009).

In community-based contexts, SoCs are interorganizational networks that aim to provide comprehensive services to improve community outcomes through coordinated activities. Considering scope, community-based SoCs primarily serve underrepresented and minoritized populations and are geographically defined on a more local-neighborhood scale (Cook & Kilmer, 2010). In this context, SoCs resemble service networks with agreements between organizations and services to provide a range of support (Lorant et al., 2019). Service networks exist across a variety of domains, including mental health (Huang & Provan, 2007; Nicaise et al., 2013), family services (B. Chen, 2008; Chen & Graddy, 2010), substance abuse (Kruse et al., 2012; McGihon et al., 2018) and homeless services (Mosley, 2021) Unlike SOCs within health domains, nonclinical SoC's in this context often operate with looser terms for participation. These care systems take a grassroots view that organizations supporting the community can participate irrespective of institutional formalization (Chavis, 2001). Lower barriers to participation coincide with the idea that community-driven SOCs include a diverse set of partners (e.g., religious organizations, mental health agencies, government agencies) offering services across domains instead of just one target area or issue space.

SoCs in community-based contexts is similar and different in various aspects. In terms of similarities, SOCs use similar technological and human capital to execute network activities and services in this context. Case management technologies (CMTs) refer community members to services from provider organizations in the care system. Though called community navigators in community spaces, patient navigators facilitate and coordinate entry into the care system and

ensure that community members have accurate information about services relative to their needs (Levinson et al., 2015).

Research on care systems is increasing just as funders and government agencies are increasing their support for this approach as a solution to address a variety of needs (Cartier et al., 2019). Nonetheless, most of the literature in this area highlights clinical settings or clinically driven issue spaces, often centering on medical providers and personnel and the healthcare environment as the primary ecological boundary where client navigation occurs. The increasing support from government agencies, particularly from local governments and funders, has led to a more comprehensive nonclinical understanding of SoCs, taking a socio-ecological view (Ahmed et al., 2018). This growth has led to a call to understand the differences and similarities between their clinical counterparts while surfacing strategies that consider nuances of diverse and often marginalized communities. Specifically examining how technological and human capital are defined and used within contexts that aim to be comprehensive and culturally informed (Im & Grumbine, 2021; Karriker et al., 2020).

This work takes the socioecological view and aims to center community-based SoCs as the primary unit of analysis. These care systems serve populations that navigate structural barriers that impede full civic, social, and economic participation (Rifkin, 2003). SoCs within this context are an organizing mechanism to provide safety and access to critical infrastructures that support life. As grassroots care systems continue to emerge, researchers must examine how they use tools to facilitate care. Doing so will surface nuanced understandings of commonly understood human and technological resource applications to support communities. This work identifies how socio-ecological motivations for service provision inform the interactions and interplay of these capitals in community-driven contexts. Specifically, this research seeks to

understand how nonclinical use of human and technological resources influences the provision of comprehensive services for community members.

As hospitals began implementing programs that addressed patients' social needs, they adopted technologies to send referrals to social service organizations. Unlike traditional electronic medical record systems, these technologies expanded features and functions to use nonclinical and clinical information in an integrated fashion (McDonald, 1997). Case management technologies are referral platforms that allow organizations to send and receive referrals for clients based on requested services. Platforms like FindHelp, UniteUs, and Integrated Referral and Intake System (IRIS) use similar core functions to facilitate referrals. These core functions relate to these technologies' affordances for organizational users. These core functions across these platforms are screening for social risks, a resource directory, referral management, care coordination, privacy protection, systems integration, and analytics (Cartier et al., 2020). Overall, these platforms serve as an interorganizational system of client management.

Research on case management technologies by community-driven care systems is scant (Nilsen et al., 2020). Broadly, information communication technologies in interorganizational collaborations afford increases in coordination across organizations and services, relational communication, and data sharing (Fu et al., 2019). Shields and colleagues (2007) study of the adoption of traditional electronic medical record systems in community health centers showed that barriers impeded communities from fully accessing the affordances of health technologies. These barriers included inadequate technical capacity to thoroughly operate or improve functions within the technology and a lack of support from experienced technical personnel and external partners. Community health centers with more underserved, uninsured, and complex needs patients were less likely to adopt health technologies fully. Thus, this work is a bridge from

previously mentioned research to understand if similar barriers in case management technology are evident in nonclinical SoC settings. This research will reexamine previous affordances of these technologies concerning community use to revise or add to current conceptualizations.

Human resources within care systems are critical to ensure that clients access and maintain services (Rosenthal et al., 2010). Patient navigators and community health workers provide support through information sharing and communication between providers and clients within clinical settings and health contexts. Successful navigation services within care systems directly influence clients' care maintenance (Nguyen et al., 2011). Navigators take on relational and functional roles when interacting with client populations. Relational roles such as friend and motivator emphasize the proximity in identities and frequency of communication. Functionally, navigators are considered and sought-after as experts when mapping out community-wide resources (Love et al., 1997; Phillips et al., 2014). Although there is an understanding of the various roles navigators play, there is a lack of knowledge of how these roles may shift when navigators are not trained clinically or do not operate in health-driven contexts. Additionally, little work showcases the interplay of SoC capitals and does not firmly center on how navigators and technology interact to mediate care (Alley et al., 2016). This work seeks to unearth similarities and differences between the description of barriers to services while expanding knowledge on how navigators use technology to support access to services in grassroots settings.

This research aims to robustly understand how human and technological capital creates pathways to community resources. Specifically, this dissertation contributes critical knowledge on how navigation services influence access to care—showing how technology meditates this process in localized and community-based contexts. This dissertation highlights the interconnectedness of technology and navigation services. This research provides insight into

how these capitals support socio-ecologically motivating goals for service provision. This work firmly situates the co-constitution or co-arrangement of materials (technology) and activities (navigation services) as the primary nexus to understanding these materials' use and ultimate impact on communities.

This work collaborates with the Community Change Collective (CCC). CCC is located across diverse neighborhoods in Chicago. This area within the city is predominantly Latinx, Black, and immigrant communities. CCC uses a care system approach to bolster community relationships and create pathways to access community-wide resources. CCC's mission is to build a broad-based organization of Christian, Muslim and Jewish faith institutions, local schools, and other Chicago institutions, enabling families to exercise common values, determine their future, and connect to improve life in their neighborhoods. Community members staff CCC. CCC uses IRIS as its primary case management technology and nonclinical community navigators to support access to care. CCC is at the forefront in this space and serves as a model for other localized SoCs starting within Chicago. CCC is an excellent site for understanding how technology and navigation services support care provision.

This dissertation has four main contributions. First, due to the collaboration with CCC, this work provides a distinctive understanding of case management technology in an urban community context. CCC is a nonclinical care system with flexible rules for membership. CCC's goal is to offer comprehensive services through a wide array of community partners (Okumus et al., 2016). Specifically, how the interdependence of utility and usability influence the use of the case management technologies by community-based organizations and how this interdependence results in different use categories created by community sense-making rather than industry sensemaking (Andrade & Urquhart, 2010; Tim et al., 2018). This work extends our

understanding of how technology is used as a tool for community relationship building and community organizing—specifically, centering populations that are left out of conversations surrounding utility and usability (Mitchell et al., 2019; Ramos & Chavira, 2022). This dissertation demonstrates how technology can support the redistribution and provision of resources to reimagine how care is accessed.

Second, this dissertation examines ecological systems theory (EST) and provides a robust empirical analysis that explains and extends our understanding of how the dimensions within this framework can more explicitly explain interactions within and across community care settings. Specifically, this project demonstrates how technology and navigation services mediate care system interactions across layers of social organization and socio-political and cultural systems (Navarro & Tudge, 2022).

Third, this dissertation provides a typology of community navigator roles. This contribution builds on previous understandings of navigation services while providing characteristics of community navigators in nonclinical and community-driven care systems. This typology is beneficial because it highlights unique experiences and aspects that drive the interactions between community-based navigators and complex needs populations—specifically, centering on the work of navigators that support marginalized and oppressed communities (DeLilly & Flaskerud, 2012; Kattari et al., 2017). Thus, offering a guide to beneficial practices and aspects to support community members during their care-seeking process.

Lastly, this work serves as a resource for communities and practitioners to help support care systems development. Thus, providing a more expansive view of the interplay of human and technological capital and their effects on community member outcomes.

This dissertation proposal goes as follows. Chapter 2 reviews the literature on systems of care as an approach. It begins by describing the origins of the system of care approach. It discusses Ecological Systems Theory as the primary theoretical basis for an SoC approach due to the constant interplay between social units and systems. Ecological Systems Theory is a framework that provides a comprehensive theoretical foundation by identifying the relationship between various levels of social organization and environmental characteristics that influence behaviors and outcomes (Brofenbrenner, 1988).

Then, it defines case management technologies, describes their use, and surfaces the common affordances it brings to care systems. It ends with navigation services explaining the different types of navigators based on sector, the purpose of navigations services, community navigators as a term for this study, and the roles community navigators play in community-based SoCs.

Chapter 3 describes the concurrent mixed-method design of this research. Specifically, qualitative interview data and quantitative service episode data will create a comprehensive view of CCC as a site while capturing the interplay of technology and navigation services across care system groups. It includes procedures for qualitative and quantitative data analysis. Subsequently, chapter 4 lays out the results in response to research questions (throughout the literature review). Chapter 5 discusses the implications of the findings. Specifically, case management technology as a tool for people and by people and the importance of alternative roles of community navigators. Chapter 6 - the final chapter will highlight key insights, the study's limitations, and areas for further research and theoretical development of ecological systems theory and technology use in local contexts.

CHAPTER 2: LITERATURE REVIEW

This research examines how care system capitals influence access to care in community-based SoCs. Specifically, it seeks to understand and surface the affordances that case management technologies bring and the role navigation services play in facilitating care for community members. This work also introduces potential challenges associated with using case management technology and navigation personnel within this context and scope, providing insight on implementation for SoC personnel, researchers, and community practitioners.

Systems of care, also known as integrated health and human service networks, are interorganizational networks that involve a variety of health and human services agencies that aim to create wraparound care for target populations (Fichtenberg et al., 2020). Like other networks in contexts such as education and crime prevention, these organizations collectively harness resources, expertise, and programs to achieve common goals. Traditionally, care systems emphasized information sharing across health providers to support positive clinical outcomes for patients with significant health needs (Varda et al., 2020). As hospitals began to recognize social dimensions influencing health trajectories, SoCs partnered with social service organizations embedded within communities to support clinical goals (McDonald, 1997). This type of network is expanding to nonclinical environments to create wraparound and continuous services to support community-driven goals for individuals and families (Mosley & Park, 2022).

The complexity and intersections of social problems have motivated a shift to understand the root causes of communities' issues. Root cause approaches emphasize alleviating adverse effects from experiences such as community violence, education disparities, and income inequality. Organizations must examine the systems that support these realities and create

strategies that match the wickedness of these systems (Weber & Khademian, 2008). SoCs with a community scope are taking an ecological systems perspective to craft community-driven solutions to improve access to services.

Ecological System Theory (EST) is a theoretical framework that identifies environmental indicators and points of intervention that move beyond one human. Traditionally, community psychologists have used this theory to examine and understand the interactions between individuals, communities, and the wider society (Bronfenbrenner, 1992). This framework has been expanded and is now in social work, public administration, and public health to explain how community development exists within complex systems of relationships and across multiple levels (Bagnall et al., 2019; Noursi et al., 2021). There are five levels within this systems model: the microsystem, the mesosystem, the exosystem, the macrosystem, and the chronosystem. The microsystem is the initial layer of the model that has the most immediate influence on a person's life. Social systems that constitute this level are parents, caregivers, teachers, and peers. Interactions within this environment are direct and personal (Hong et al., 2011; Odom et al., 2004; Swick et al., 2006). The second layer is the mesosystem.

The mesosystem is shown through the relationships between an individual's microsystems and their interdependence. The mesosystem is the interactions between social units in the microsystem that assert influence on all parties involved. For example, if parents and siblings have a bad relationship, this should negatively affect an individual's development. Thus, the mesosystem is a construction of microsystems (Odom et al., 2004). The third layer is the exosystem. This layer involves formal and informal structures that can indirectly or directly influence one's life. The exosystem comprises local environments, such as neighborhoods, organizations, technologies, industry, and community spaces (Abrams & Theberge, 2005; Hong

et al., 2011). These components are external to an individual but can affect their quality of life (Brofenbrenner, 1988). In this layer, interactions are through more formal structures that can impact the accessibility of resources. The fourth layer is the macrosystem. The macrosystem emphasizes culture and society as the main components that exercise influence life. These components are wealth, poverty, ethnicity, and socioeconomic status. These macrosystems differ from the aforementioned layers because these systems are predefined and established and can express an undue influence on intrapersonal relationships, interpersonal relationships, and the ability to obtain full civic and social participation (Swick & Williams, 2006). The last layer is the chronosystem, which includes significant life changes and historical events (i.e., COVID-19). This theoretical framework is essential to explaining how SoCs operate. Research has called on more empirical studies and observations that showcase the interactions between the five layers (Hill, 2021; Neal & Neal, 2013). Especially as human service workers increasingly need to understand how broader systems adversely impact clients to support effective interventions (Fisher & Hotchkiss, 2008).

This dissertation argues that care systems exist within and across these layers. Precisely, the actors involved in care system work embody these complex relationships. Care system personnel such as community navigators and backbone staff hold roles as parents, teachers, and community members and serve individuals and families (microsystems). The interactions across these actors influence how care can be accessed (mesosystems). SoCs with a community scope operates within neighborhoods and coordinate community connections through case management technology to increase the likelihood of access to resources.

Additionally, they involve government agencies, nonprofits, religious organizations, and industry partners (exosystems). In community-driven care systems, target populations confront

structural barriers created by racial and economic inequality, which has both indirect and direct influences on how successful community members and the SoC itself can be in promoting and maintaining access to services (macrosystems). Major events such as a global pandemic and social unrest have significant implications on the ground for care systems (chronosystems). Thus, SoCs are well-positioned to operationalize these various layers and highlight their intersections. This work positions itself in unearthing how interactions within the mesosystem (navigation services) and the exosystem (technology) support and mediate access to community resources.

Most of the research on SoCs is within clinical settings. Initially, these networks were thought of as mechanisms to support positive clinical outcomes for patients dealing with significant health events. These networks create pathways to services across primary care providers and specialists. SoCs allow providers to share information about services needed and overall patient health status (Suarez et al., 2012). This approach to service provision has evidence of success. Specifically, providing comprehensive acute care to populations in a timely and effective manner increases the likelihood of positive outcomes across various disease categories such as stroke and cancer (Alberts et al., 2013; Meretoja et al., 2010; Stout et al., 2019). Care systems serve as a preventive tool that can reduce the financial burden of participating institutions by supporting uninsured patients to enroll in Medicare and lower the probability of high-cost visits and long-term care for patients through consistent interventions (Denham et al., 2013; Rappange et al., 2009).

Clinically driven systems utilize formal structures and protocols to coordinate care. Care systems in these contexts connect to established health centers that have the capacity and the resources to serve as a leading

organization and incentivize other partners to collaborate (Denham et al., 2013). Personnel responsibilities emphasize clinical activities over programmatic activities related to screening for side effects or peripheral illness (Stout et al., 2019). Care system personnel are medical professionals, and thus, care system goals emphasize medical outcomes for patients and cost efficiencies over other domains (Bokhour et al., 2009). The success of these systems within clinical environments has influenced their adoption in non-clinical contexts. As this adoption continues, distinctions arise when implementing and executing care systems in nonclinical settings.

Due to the benefits shown by SoCs in clinical contexts, this approach is proliferating to serve various populations and communities. Within community-based and localized spaces, care systems support full participation and integration into community life. SoCs can support collective sensemaking around strengths and challenges that individuals and families face and serve as a way to locate and access community resources (Anderson et al., 2008). Burn and Goldman (1999) state that the philosophy of an SoC with a community-driven scope is to embody what it means to wraparound entirely. Wraparound is a term that describes the act of families, professionals, and informal community supports coming together to collaborate and implement services and interventions for development. In nonclinical contexts, this moves beyond connecting functional departments or specializations, rather building a comprehensive interagency collaborative effort connecting diverse organizations mobilized to provide flexible assistance and build on the power that already exists within a community (Burns & Goldman, 1999; Huang et al., 2005).

These systems have shown to be beneficial in supporting veterans and their families in accessing human services (Saitgalina & Council, 2019). SoCs provide coordinated wraparound

care to serve homeless populations (Mosley & Park, 2022). Moreover, this approach supports

implementing trauma-informed care for children and families to keep families together and

provide services in their community. In these cases, SoCs operate as both a resource directory

and a collective commitment to support life-promoting practices to limit the effects of traumatic

and violent events (Anderson et al., 2008; Winter et al., 2007). Similar interorganizational

arrangements are seen in education with the community at school approach, providing non-

educational social services at and beyond school via partner organizations (Min et al., 2017).

As this approach increases in use to serve various populations and contexts, literature is

scant on demonstrating the empirical outcomes of processes and activities that influence the

ability of SoCs to ensure access and maintenance of care (Fichtenberg et al., 2020). Specifically,

more work needs to address how contexts matters when assessing performance and the use of

capital to achieve collective goals (Cook & Kilmer, 2010). Moreover, there is a growing call to

demonstrate how ecological systems theory as a framework for community development is

operationalized to expand critical thinking to support the growth of resilient and prepared

communities (Chigangaidze, 2021). This call emphasizes the need to demonstrate how the

various layers in this framework interact (Hill, 2021).

Although more community-driven SoCs have been used to serve a variety of high-need

populations, most of the available work emphasizes one population or target group for impact.

What happens when the goal of a community-based SoC is to improve the lives of all those that

reside within certain geographic parameters rather than a specific issue area? This work aims to

understand how comprehensive care shows up through a community-organized SoC that seeks to

serve a wide array of populations. This work examines navigation services and case management

technologies as mechanisms to support access to care. Ultimately, it allows us to observe the

interaction of two key dimensions (mesosystem and exosystem) within the EST framework.

Case Management Technologies

The tools systems of care of use to execute operations influence how effectively and

efficiently services are provided to clients. Technology and human capital are essential to ensure

that providers communicate with one another. Critical information about service requests allows

practitioners to categorize and follow through on service delivery appropriately. Electronic

medical records systems (EMRs) were the primary mechanism for sharing patient status and care

information with other healthcare providers in clinical settings. As hospitals began to become

incentivized to focus on the social conditions of patients, case management technologies became

the go-to method to connect with a broader array of service providers (McDonald, 1997; Wager

et al., 2000). Case management technologies enable SoCs to communicate with partner

organizations through a shared platform that allows for the flow of service requests between

complementary organizations. CMTs support wraparound care because it serves as a repository

of services within an environment and can be accessed by those who need them. Similar to more

market-based contexts, CMTs offer care systems and partner organizations affordances (Landi,

2020).

Case management technologies serve as a platform that electronically holds data and

facilitates referrals. These technology systems create communication channels with traditionally

disconnected organizations to assist with the throughput of service requests (Fernández-Méndez

et al., 2020). Due to EMRs' inability to track and manage services across providers, a group of

technology companies created CMTs to coordinate care across various user agencies (Cartier et

al., 2020). Government agencies, community-based organizations, and health providers use technology platforms such as FindHelp, UniteUs, and IRIS, to assist in social risk screening and determine the appropriate interventions to limit and mitigate adverse effects from socioeconomic and health insecurities (Cartier et al., 2019). These types of technology integrate smoothly into workflows to support the needs of both the system of care and organizational users (Weiner et al., 2019).

Functionally, CMTs support the flow of referrals between organizations. These tools allow organizations to input client information such as demographics, geographies, and requested services to capture the variety of available resources within a care system. These technologies support intervention and care teams in executing client requests and serve as a mechanism to know the ongoing status of client needs. Care systems use CMTs to provide interoperable client management. This allows personnel to access and input information in real-time regardless of location, enabling organizations to provide more optimal and customized care for clients (O'Connor et al., 2009). The primary users of CMTs are navigators, social workers, volunteers, care coordinators, and nurses. The use parameters for these technologies coincide with a willingness to participate and funding. Thus, care systems that provide access to services vary depending on those parameters. CMTs are also used to increase traffic to provider or partner organizations allowing for more of a distribution of service requests and broader use of available resources (Cartier et al., 2020). Ultimately, these technologies integrate and mobilize human services to address the co-occurrence of complex needs (Fichtenberg et al., 2020).

The use of case management technologies offers care system partners affordances that benefit workflows and provide opportunities to increase efficiencies across operations for client management (Fu et al., 2019). Technological affordances are the "mutuality of actor intentions

and technological capabilities that provide the potential for a particular action" (Faraj & Azad, 2012). In using an affordance lens, there is an emphasis on symbiotic relationships between the actions taken when using technology and the capabilities of technology (de Souza, 2005; Hadfield & Jopling, 2014). This symbiotic relationship surfaces how human entanglement with technology can provide a language to contextualize how technological affordances shape our experiences (Lee, 2010; Maier & Fadel, 2009). Through case management technology, there is a potentiality for SoCs to create ease in operations and optimize service integration for clients (Faraj & Azad, 2012; Leonardi, 2011).

The affordances that case management technologies connect to its features. Technical characteristics of CMTs that provide advantages for SoC operations are resource directory, searchability, client access, social risk screening, needs identification, referral tracking, and reporting and analytics. CMTs' ability to hold information about clients and services allows SoCs to utilize a resource directory. A resource directory contains a list of providers, relevant contact information, and services provided for specific needs. CMT's ability to serve as a resource directory provides a consistent and real-time community resource map (Cartier et al., 2020; Dunlop et al., 2016). This aids in understanding community-wide capacities for human service needs and creates the ability to identify gaps in services. Second, searchability refers to the power of care teams to look through various information to locate eligibility requirements for particular services (Rice et al., 2017). In some CMTs, you can search for multiple services and associated eligibility requirements at once. Thus, allowing SoCs to lower the probability of client rejection from services. Third, is the ability of clients to access CMT information. Some platforms enable clients to initiate referrals and view the status of requests directly within the

platform. This feature creates more paths for access to the care system (Heinemann et al., 2004; Wideman, 2011).

Fourth, when accessing services, CMTs can screen for social needs. This allows care team personnel to understand the social risks and conditions associated with clients and the potential dangers of not receiving services, ensuring that wraparound care occurs (Chung et al., 2016; Lathrop, 2020). Fifth, some platforms offer predictive analytics to infer other services necessary to support a client. Predictive needs identification is another mechanism to ensure that needs not identified through other screening methods can be identified (Amarasingham et al., 2014). Sixth, case management technology permits intervention teams to track referrals and service requests in real-time. This affordance gives SoCs the ability to be aware of client needs in real-time while serving as a tool for longitudinal case management (Rahm et al., 2007). Finally, CMTs can produce exports of data for reporting and analytics. CMTs' ability to serve as a data repository allows SoCs to run analytics to understand efficiency and effectiveness. This is beneficial in communicating the impact an SoC makes to funders and other external parties (Carman, 2009; Yigitbasioglu et al., 2021).

This research extends the theory of technological affordances to SoCs. Gibson (1979) describes affordances as the ecological world's ability to support interaction and action, emphasizing the connection between a species and its environment. This notion is extended to the physical properties or technologies perceived and ultimately used. This notion highlights the utility and usability that technology can provide (Norman, 1988). Utility or usefulness refers to what the design of technology can offer and how it achieves a user's goals. Usability refers to creating perceptual information that communicates the advantages technologies can make (McGrenere & Ho, 2006). Utility and Usability are increasingly interdependent as users

approach technology as creators with the aptitude to reimagine their objectives (Hadfield & Jopling, 2014). This theorization has yet to be fully explored around case management technologies in community-based contexts (Andrade & Urquhart, 2010; Tim et al., 2018). Especially the interaction between usability and utility being culturally shaped modalities of communication, representation, and community sensemaking (de Souza, 2005; Hadfield & Jopling, 2014). Hence, this work unearths how these technologies shape the experience of community-based organizations and their ability to support the provision of care for complex and deserving populations outside of a clinical environment.

Functionally, CMT use by non-clinical community-based SoCs is very similar to its counterparts. These technologies are used by care coordinators, community navigators, or volunteers (Cartier et al., 2020). CMTs for communities allow community-based organizations to identify and connect with other organizations to identify community resources available for community members. These technologies are tools to bolster community connections and provide more pathways to services for community members (Lindau et al., 2016). CMTs give these SoCs the ability to screen for social needs and provide wraparound care in an expedited fashion (Gottlieb et al., 2021). Moreover, CMT use in these contexts is bounded by local geography. Unlike clinically driven SoCs, which emphasize specialties or programmatic areas, access to use case management technology is holistically driven by community-level goals (Butterfoss et al., 2002). Thus, the type of organization that uses a CMT includes organizations outside traditional health and human services agencies (i.e., religious organizations, nonwestern healing centers, social movement organizations).

Although CMTs support and expand access to resources for community members, implementation and use of these technologies are often fraught with broader barriers that these

same SoCs are trying to address on the ground (Mayberry et al., 2009). Specifically, community-based SoCs and community-based organizations often struggle with the capacity to take full advantage of the affordances of these technologies and other practices (Porteny et al., 2020). These SoCs often lack the financial resources to continue to invest in training to ensure that users of CMTs are well versed in features and capabilities (Hogg-Graham et al., 2021). This can result in Community-based SoCs struggling to attract and retain organizational users due to staff serving a variety of roles in the community resulting in limited time to dedicate to SoC work (Yung et al., 2008). Additionally, the design of CMTs is by vendors and funders due to a lack of government regulation in this space. Thus, vendors are de facto policymakers and are not required to consult with community-based SoCs or organizations to develop these technologies (Freij et al., 2019). These challenges result in inefficiencies for clients and community partners.

These challenges result in potential downfalls in CMT use within SoCs because they connect to systemic barriers that impede community members from accessing services. Specifically, those who encourage CMT adoption bring assumptions about organizations' ability and capacity to execute these technologies. This reality demonstrates the theoretical underpinnings of the EST framework, which suggests that all five layers of systems influence one another. These downfalls of CMT use showcase how elements such as economic inequality within the macrosystem affect how aspects in the exosystem, technology, are ultimately used (Bronfenbrenner, 1992; Swick & Williams, 2006). These interactions within the macrosystem permeate outwards, creating barriers to optimal technology use for community-based SoCs. This has led to a call for research to highlight CMT use in community-based SoCs to understand better how these assumptions and affordances are actualized (Cartier et al., 2020; Yigitbasioglu et al., 2021). This work aims to capture the perceptions and characterizations of CMTs as

interventions while understanding how the use of CMTs mediates access to care for community members.

RQ1*: How do community-based network members perceive or characterize case management technology use in collaboration?*

RQ2*: How does the use of case management technology by community-based organizations mediate access and connection to care?*

Navigation Services

The personnel who use case management technologies in SoCs are essential when discussing the impact they can make on the communities and populations they serve. The care-seeking process can be difficult for clients due to the complexity of navigating eligibility requirements, documentation requests, stigma, and managing communication with providers (Betz, 2004; Gould et al., 2012; Siklos & Kerns, 2006). To ensure that clients have support throughout their care-seeking process, SoCs provide assistance through dedicated personnel that coordinate communication and facilitate information exchange. Care systems rely on navigation services to ensure that case management technologies support client engagement with services while serving as the immediate third party between providers and clients (Broaddus et al., 2017). These services aim to center the whole person and whole family in the integration of service delivery (Pizur-Barnekow et al., 2021).

Navigation services assist clients through the health care system and accessing resources from social service organizations and government agencies (Love et al., 1997). Titles often associated with navigation services are community health workers, patient navigators, social workers, family navigators, and community navigators. Navigators come from various

professional and life paths (Kelly et al., 2019). Within a more clinical context, The Children's

Health Insurance Program (CHIP) states that the role of community health workers is to serve as

a conduit for awareness, outreach, and enrollment in primary medical care (Children's Health

Insurance Program Reauthorization Act, 2009). As staff members a part of care teams, their

primary motivation is to increase capacity for individuals and communities. In interacting with

clients, they emphasize peer-to-peer connections as the primary pathway to share information

and ease stigmas surrounding services (Rosenthal et al., 2010). Successful navigation creates

beneficial medical and social outcomes and increased engagement in social services (Desrosiers

et al., 2016; Freeman, 2013; Natale-Pereira et al., 2011).

This work will use the term community navigator to describe those who operate

navigation services for community-based SoCs. Although there are many similarities between

the various titles and functions for navigators across domains, community navigators take a

comprehensive view of the goals associated with entry into a care system. This indicates that the

primary goal is not only to connect community members with medical care but with community-

wide resources that support their growth in multidimensional ways. Additionally, community

navigators emphasize culturally competent practices that mitigate trauma and perceived barriers

(Shommu et al., 2016). Furthermore, there are substantive differences in experiences between

community navigators from community-based and clinical models.

Specifically, community-based SoCs use more organic methods like word of mouth and

rely on historical community relationships to identify and recruit personnel (Wynn et al., 2011).

Those recruited are local experts, have amassed a wide array of critical knowledge of community

resources, and play essential roles in transformational change (Garcia et al., 2022;

Mathiyazhagan, 2020). In more clinically driven navigation models, SoCs use more formalized

practices for recruitment, such as flyers and placing ads. Navigators in this space rely on

technology (e.g., mail communications) to communicate with those seeking care, while

nonclinical models emphasize face-to-face interactions as much as possible (Feltner et al., 2012;

Ma, 2009; Williams et al., 2013). They also have more internal recruitment efforts for

navigators, indicating that personnel holds more traditional training and expertise within clinical

areas (Hou & Roberson, 2015).

In the philosophy of wraparound care, successful navigation is important to achieve care

system goals. Community navigators establish connections between families, community

members, SoC personnel, and service providers. Historically, underrepresented and minoritized

populations have fraught and violent experiences seeking services (DeLilly & Flaskerud, 2012;

Kattari et al., 2017). Atrocities such as the Tuskegee Experiment and steady discrimination in

social services have created structural and perceived barriers that impede access to a range of

critical infrastructure supporting life (Brandt, 1978; Kelly & Lobao, 2021). These realities have

painted the spaces where these services exist as unsafe and unwelcoming (Haire et a., 2021). An

SoC's navigation service is the primary mechanism to mitigate and ease tensions to support

community members to receive care. SoCs use navigation services to address these violent truths

through interpersonal relationships emphasizing familiarity and community. In doing so, creating

safe spaces for inquiry, vulnerability, and mutual respect.

Community navigators hold similar identities, are from the same neighborhoods, and

share similar experiences of discrimination with broader social systems (Narayan & Wedeking,

2012). In community-based SoCs, community navigators are the bridge that allows community-

based SoCs to be a space where community resources are community-determined and

community-controlled (Fischer et al., 2008). Culturally competent navigation services increase

access to receiving and maintaining care leading to improved clinical outcomes (Liu et al.,

2018). Comprehensive literature reviews have demonstrated the efficacy of navigation services

in improving psychosocial wellbeing and adherence to treatment plans (Adler, 2008; DiMatteo,

2004). Community navigators coordinate care logistically while providing deep emotional

support. The intersection of these roles often pushes past professional boundaries emphasizing

the relational dynamicity and the integration of community navigators in clients' lives (Phillips et

al., 2014).

Community navigators' deep relational connections with community members and their

expertise in maneuvering through systems demonstrate how this role is constantly changing to fit

and support the dynamicity of community needs and community life. The functions that

navigators play often sit at the intersection of their roles within their communities and within the

care system. Outside of sharing similar identities, community navigators are mothers, fathers,

organizers, and neighbors who assist in their care processes (Maxwell et al., 2020). This level of

familiarity influences how community navigators carry out their job. The roles often discussed

for community navigators are friend, motivator, external supporter, and knowledge broker (Funk

& Hounslow, 2018; Phillips et al., 2014). The community navigator role as a friend develops

through previous or familiar community ties. The identity as a friend comes through consistent

communication about events in community members' lives. A community navigator knows the

intricacies of a client's life and events that may impact care plan goals (Busza et al., 2018). The

role of the motivator involves encouraging clients to maintain a connection to care. The care-

seeking process can be complex and require clients to maintain consistent attendance and

documentation for eligibility while juggling daily life (Falconer et al., 2020). Community

navigators serve as a safety net and safe space to communicate frustrations and ease worries to ensure that clients stay on track (Johnston et al., 2019).

The role of external supporters emphasizes their ability to be a supporter that is not family or an immediate relative. Clients perceive community navigators as being distant enough from family to communicate about sensitive issues relative to their needs. This role allows the client to inquire about a range of services that they may not feel comfortable doing otherwise (Phillips et al., 2014). Lastly, community navigators play the role of knowledge brokers (Davoust et al., 2021; Shapiro, 2020). This role emphasizes the ability of community navigators to serve as subject matter experts. Clients rely on community navigators as the primary source of information and communication about their care plans (Wallace et al., 2018). Thus, community navigators communicate the importance of a range of services in lay terms and serve as the intermediary between providers and community members (Morgan et al., 2015). Community navigators expand boundaries by connecting individuals and organizations across socio-cultural lines that would have otherwise remained disconnected (Wallace et al., 2019). The role of a knowledge broker is most proximate to the formal explanations of the role of the community navigator as a guide to support members as they interact with various organizations and broader social systems.

The importance of navigation services demonstrates how interactions between social units in the mesosystem influence how the care-seeking process unfolds (Brofenbrenner, 1988; Odom et al., 2004). Interactions with clients, families, and others in the broader community impact how care is understood and provided (McIntosh et al., 2008). Thus, unsuccessful navigation can be detrimental to clients and the ability of care systems to achieve community goals (Cosgrove et al., 2014). Successful navigation requires the financial capacity to provide

continuous training and pay for full-time navigators (Kok et al., 2015). Community-based organizations often struggle to retain staff and personnel, leading to high turnover and affecting community members' access to care and the available services (Basso et al., 2020). Although we know about critical barriers that impede access to services, we must expand our understanding of how these barriers show up in navigation services for community-based care systems that are not clinically driven or medically motivated. Especially as community-based SoCs continue to grow and collaborate to support high-need populations with emerging and innovative technologies (D'Adamo et al., 2012; Falconer et al., 2020; Kok et al., 2015).

RQ3*: How do community navigators in community-based SoCs influence access to care?*

CHAPTER 3: METHOD

Research Context

The data in this dissertation comes from the Community Change Collective's System of Care (CCCSOC). CCC and CCCSOC are pseudonyms. The Community Change Collective (CCC) was established to confront the long history of structural racism in Chicago. Initially, a group of local religious organizations formed a coalition to support a multiracial and multicultural response to the increasing diversity across neighborhoods in Chicago. As the diversity of populations grew, CCC leaders led the charge to make a broad community-based coalition of community partners to ensure that children and families' interest was heard and activated. In its work, CCC understands that eradicating structural inequalities requires a community and grassroots approach. CCC diligently builds relationships across socio-cultural lines and believes that those most affected by the violence of these systems should determine the

solutions. CCC aims to use community relationships to ensure that old and new residents control the decisions impacting their neighborhoods. CCC received the John D. and Catherine T. MacArthur Foundation's MacArthur Award for Creative and Effective Institutions. This award is the organizational equivalent to the MacArthur Foundation's Genius Award for individuals.

The mission and vision of CCC are to advance racial equity and economic justice through community relationships and community-led solutions. In its work, CCC aims to interrogate and dismantle systems that create harm. CCC seeks to support and center residents through advocacy and redistribution and increase access to resources. CCC wishes to enable families to exercise common values and determine their future. CCC aims to grow community power by connecting community partners, families, and individuals to reclaim community spaces and readdress wrongdoings perpetrated by community outsiders. CCC seeks to coalesce community partners and local stakeholders to create and execute strategies to address crime, educational disparities, and other pertinent community-determined issue spaces. CCC's care system seeks to impact three major areas: Schools and institutions, mental health, and relationships. The primary goal of this care system is to improve community wellbeing and increase community power through the provision of community resources. CCC connects over 15 organizations and multiple services across five neighborhoods. Care system partners include religious organizations, local schools, and human services nonprofits.

CCC's system of care serves one of the most diverse areas in the city. The neighborhoods CCC focuses on are home to a significant immigrant population and Black and Latinx residents. Due to its local and community-driven context, CCC hires community members to serve on its strategic teams, and leadership to conduct daily operations. The total number of CCC staff is 61, with a budget of $4,989,202 in 2019. CCC staff serve as community outreach coordinators,

contact tracers, community organizers focusing on advocacy, and public health ambassadors. CCCSOC is a nonclinical community-led care system and offers various services and supports to address community needs. These services are adult enrichment, citizenship/immigration services, dental care, employment, youth leadership, behavioral health, healthcare, housing assistance, legal assistance, material needs, and public benefits support. Examples of adult enrichment are arts and crafts, know your rights, family engagement, academic success, leadership development, and digital literacy. Citizenship and immigration services support community members with visa applications, work permits, replacement/renewal of permanent residence cards, and support with the cases at the United States Citizenship and Immigration Services office (USCIS). Dental care offers services connected to promoting, preventing, and treating various oral health issues. Employment services provide workforce development training and job pipeline programs. Youth leadership services offer opportunities for leadership development and civic engagement. Behavioral health services include crisis support, outpatient mental health services, and intensive placement stabilizations.

Healthcare programs emphasize adult medicine, women's health, pediatrics, counseling, and psychiatry. Housing assistance includes access to low-interest loans, community development grants, and support applying to rental and mortgage assistance. Legal services provide low-income community members with access to lawyers that can support them with essential legal advice. Material needs programs offer emergency food packs, suppers at several locations, meals to children after school and during school breaks, and meals to seniors served in community gathering places and delivered to their homes and access to clothing. Lastly, CCC supports community members in applying and reapplying for public benefits, including temporary assistance for needy families (TANF), supplemental nutrition assistance program

(SNAP), Medicaid, Medicare, and unemployment. Thus, CCC's scope and localized nature are beneficial to expanding our understanding of how care systems support the provision of these services to diverse and deserving communities.

CCC uses IRIS case management technology to hold data and facilitate referrals for services across community partners and encourages a decentralized approach where all community partners can send referrals. IRIS tracks information that includes community member demographics (e.g., age), partner organization characteristics (e.g., services provided, number of users), and service requests status (e.g., service type, time created, time accepted, time closed, originating organization, and receiving organization). The flow of service requests is documented via service request status (see Figure 1). IRIS is a data-driven referral technology that is HIPPA compliant and offers reporting techniques that capture the trajectories of care and services accessible in a community. IRIS provides a closed-loop referral platform, standardized forms, real-time notifications, and a partner capacity indicator. The creators of IRIS are academics and practitioners affiliated with the University of Kansas. The goal of IRIS is to build healthy communities by connecting families to the right services and empowering communities to make collaborative decisions that lead to a co-creation of community readiness tools. IRIS aims to be a tool that mobilizes people power. This dissertation uses data from IRIS from September 2021 to November 2021. CCC employs community navigators at local schools as the main entry point into accessing services. In collaboration with other stakeholders, community navigators identify families and individuals with needs. Service requests are entered into the IRIS case management technology and sent to partner organizations. Service requests are tracked and managed by referring community navigators and backbone staff. If service requests are not

accepted within 48 hours, community navigators follow up with the provider organization for a status update and find alternative routes to connect community members to care.

Figure 1. *Flow of Service Requests*
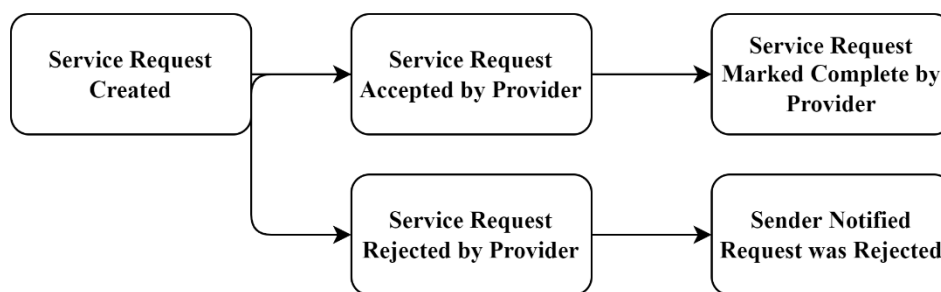
Mixed-Method Research Design

There is a growing perception that gathering different but complementary data on the same topic affords a more comprehensive view and understanding of a research problem (Greene, 2007; Lawson et al., 2007). A mixed-methods approach allows a researcher to capture the multifaceted dimensions of the social world. This approach recognizes that any given method of social inquiry is partial. Thus, using multiple "ways of knowing" allows researchers to increase the validity of their findings and generate broader inclusive understandings that honor the complexity of social relationships (Greene, 2005). This works positions itself by using a mixed-method approach to understand how case management technologies show up in a community-based care system. Specifically for the first research question, this work demonstrates how technology is used and how its users perceive its use through the combination of quantitative systems data and qualitative interview data. This work uses frequency analysis to descriptively unearth how technology use is shown across service types and organizations and a grounded qualitative approach to demonstrate how users perceive their use and its benefits. This

approach indicates this study's willingness to be fully open to complementary or divergent findings, showcasing the potential nuances of data (Bazeley, 2018).

Additionally, a mixed-methods approach permits this study to position community members' voices and quantitative systems data to honor and capture the complex mutuality between case management technology and people in a community-based setting. In terms of data collection and examination, the design of this study is concurrent because quantitative and qualitative data are combined at one or more stages of the research and given equal weight in answering research questions, unlike sequential methods, where one type of data is followed by the other (Leech et al., 2010). This dissertation uses a mixed-methods approach because it provides an in-depth view of an interorganizational site's ability to use technology to support community-driven solutions. The second and third research questions do not use a mixed-method approach and rely on single methods to provide insights.

Data

This dissertation uses both quantitative and qualitative data. This research draws quantitative archival data from the IRIS case management platform from September 2021 to November 2021 (see Table 1a). This data provided a full quarter of information about network operations. This window provided a total of 467 service episodes across the care system. Service episodes contain information about requested services by a community member. Specifically, the requested services, the time the request was created, the time the request was accepted, the time the request was closed, the sending organization, and the receiving organization. Service episodes can also include the age of a community member requesting services. Any identifying information from the data was stripped by care system staff. This research uses qualitative

interview data from semi-structured interviews (see table 1b) with 13 out of 18 organizational

representatives resulting in a response rate of 72 percent with an average length of 43 minutes

over Zoom. This resulted in 122 transcribed pages that the author cleaned. For security,

interview data was uploaded to Northwestern Box and only accessible by the author. All

interviews were transcribed using TEMI software and coded using Dedoose software.

# Service Episodes	Data Window
467	9/1/2021 – 11/30/2021

Table 1a. Total count of service episode data. Dates are in month/day/year format.

Interviewees represent various affiliated organizations of CCC. Interviewees interact with

IRIS the most in their organization. As mentioned in the research context, member organizations

represent religious organizations, community health centers, hospitals, nonprofits, and

community-based organizations. These organizations seek to work together through community

relationships to co-create solutions and paths that access community-wide resources. These

organizations have offices and access points across CCCSOC neighborhoods.

Question Category	Interview Question
Technology	How would you describe your first experience using IRIS?
	Can you tell me a story about how IRIS successfully supported your organization's work?
	How frequently do you use IRIS?
	What features do you not use as frequently?
	Why do you think you use them less?
	Can you describe confusing functions or

	features of the technology?
Roles of Community Navigators	How do community members usually come in contact with the care system?
	Can you walk me through a day of work? When do you interact with community partners or providers?
	Can you tell me a story of when it was difficult getting a community member to access services?

Table 1b. Interview protocol.

Measures

This dissertation uses metrics from the system's data that characterizes how service request flow through the case management technology. These metrics are time to accept, time to close, rejection rate, and share of referrals by service type and organization. Time to accept refers to the time service episode is created to the time the receiving organization accepts it. Time to close refers to the duration between the time a service request is accepted and the time a receiving organization marks it as closed. Share of referrals refers to the overall distribution of service requests by service type, receiving, and sending organization. These measures are aggregated to percentages from the organizational level to the broader care system levels.

Analysis

This dissertation aims to capture the perceptions and characterizations of CMTs as interventions while understanding how the use of CMTs and the roles of community navigators

influence access to care for community members. To achieve this goal, this work performs a mixed-method analysis given the structure of the research questions. Specifically, systems data is analyzed simultaneously through frequency analysis and interview data through a grounded qualitative approach for the first research question. Frequency analysis is used to understand the distribution of service types, service request status, and organizational users in the archival systems data. The grounded coding approach identifies relevant categories and rationales associated with case management technology by organizational users. First, to understand the perception and characterization of case management technology use in collaboration (RQ1), this work examines quantitative systems and qualitative interview data. Descriptive statistics are pulled from systems data after performing a frequency analysis through computations in R. This analysis captures relevant metrics like time to close, time to accept, and share of referrals by an organization and service type. This dissertation uses a grounded theory approach (Corbin & Strauss, 2015) with some conceptualizations from the literature to surface categories of technology use by participants. There is an assumption that the predetermined affordances of features of case management technologies would influence some conceptualizing of use for research participants. Grounded theory implies an inductive process that uses no pre-existing theories and creates a theory based on the interpretation of data. This approach provides significant flexibility in understanding the nuances of the qualitative data.

The standard open and axial coding procedure was performed to analyze interview data. Open coding led to identifying features and mechanisms of the case management technology that participants described as pertinent to their work in the organizations. This step produced 285 codes. To simplify the open coding process, codes were merged that were similar to one another and reduced the number of codes to 47. Next, the identification of mechanisms occurred for axial

coding and led to larger categories to identify themes (Braun & Clarke, 2012; Guest et al., 2012). Axial coding led to 5 categories of factors representing the role of case management technology in community-based care systems (see Table 7b in Chapter 4).

To understand how the use of case management technology by community-based organizations mediates access to care (RQ2), frequency analysis was performed to capture relevant metrics. This question is descriptively driven because it emphasizes the outputs and outcomes observed from the systems log data. These metrics are time to close, accept, and share of referrals by an organization and by service type.

For research question three, regarding what roles community navigators take to support community members to access care, data were drawn from semi-structured interviews with backbone staff, community navigators, and community partner organizations, involving thirteen out of eighteen organizational representatives. Using a grounded theory approach, this work employed a line-by-line open coding process to surface any relevant information regarding the roles and activities of community navigators. This resulted in 285 codes. To streamline the open coding process, similar codes were consolidated codes, leading to 53 codes. Characteristics for community navigator roles were identified for axial coding and placed in larger categories to identify themes (Braun & Clarke, 2012; Guest et al., 2012). Axial coding led to 6 categories with characteristics representing the roles of a community navigator (see Table 8). Similar to the qualitative portion of RQ1, the grounded theory approach provides adaptability to understand the nuances of the qualitative data while being guided by sensitizing concepts from the literature about preexisting notions of community navigator roles.

Chapter 4: Results

Descriptive Statistics

To dissect how the case management technology is used by care system personnel and the characterization of the technology, observed statistics shown through descriptive analyses with qualitative examples illustrate these metrics (RQ1). In analyzing the 467 service episodes, the average time to accept across the care system is 1.8 days. The average time to close is 16.1 days across the care system. Comparing these metrics with similar human service networks indicates that this care system performs relatively well in connecting community members to services (Gibson et al., 2022; Saitgalina & Council et al., 2019). This care system connected 78 percent of community members to services. Nonetheless, these statistics suggest variation across dimensions within the care system regarding how the technology use.

Time to Accept	Time to Close
1.8	16.1

Table 1c. Average number of days to accept a service request and complete a service request across the care system.

This variation shows up in participating organizations. Specifically, where community members' requests are being sent and being received. Although this care system encourages a decentralized approach when utilizing the case management technology, most dispatched requests are from care system backbone staff and functional groups totaling 89.8 percent of all service requests. Backbone staff and functional groups are personnel that is housed and on the payroll of CCC, which is the convening agency. The majority of service requests come from the CCC's public health ambassadors, with 55.2 percent of the service requests. Public health ambassadors are CCC personnel that assists in connecting community members to services that

support COVID-19 relief related to outreach and education. One reason for this unequal use

pattern is the centrality of IRIS in the workflows of community partners. One community partner

described IRIS as secondary to more traditional methods to connect. "IRIS is not like our default

most of the time when we're already on IRIS; it's a lot easier too if it's already open to think like,

oh, yes, let me make that referral through IRIS, but it's, it's hard when you already establish these

relationships with certain connectors to these orgs." Another explanation is that community

partners are using internal platforms to manage requests once they receive them and connect with

partners outside of the care system, "So, then after that is done, once we make that phone call,

then we will submit the referral internally through our own network."

Organization	Share of Referrals
People's Coalition	0.44
Healthy Collective	9.7
CCC– Public Health Ambassadors	55.2
CCC – Navigator 1	2.19
CCC – Navigator 2	3.8
CCC – Navigator 3	11.4
CCC – Navigator 4	0.21
CCC – Navigator 5	4.1
CCC – Navigator 6	12.52
CCC – Navigator 7	0.44

Table 2. Percent of service requests/referrals from sending organizations in the care system.

For community partners receiving service requests, the distribution of these requests

reflects a distribution that leans toward a small set of community partner organizations. Food

Delivery Initiative received most service requests totaling 74.9 percent of the total received

referrals during this time. The public benefits arm of CCC received 8.13 percent of the total received referrals. The public benefits arm of CCC connects community members to services (e.g., TANF, SNAP) offered by the state. These results connect to explanations from community partners and other care system members. One community navigator illustrates their community's state of need: "A lot of families, they feel like, oh I don't, I don't need the help. I don't need the help for food. But once they know a little bit more, they say, oh, okay. So, that's not going to affect me. Because of my situation, or they will not talk about me because that is secure information."

Additionally, another navigator explains the importance of access to public benefits for mothers in the community, "I'm focusing on public benefits. So, they call me because they need assistance for the medical or the link. And so, I guide them to do it."

Organization	Share of Referrals
Religious Charity for Change	3.96
Food Delivery Initiative	74.9
Community Health Services	3.3
Community Council	0.22
Regional Family Services	1.32
Local Housing Services	0.22
Build Up	0.66
Everest Health System	2.42
CCC - Employment Support	0.66
CCC - Housing	0.88
CCC - Immigration	1.10
CCC - Parent Engagement	0.44

CCC Navigator	0.44
CCC - Public Benefits	8.13
Employment Opportunity Center	1.32

Table 3. Percent of service requests/referrals based on receiving organization in the care system.

There were only 12 rejected service requests. Results indicate that all rejected referrals come from backbone staff and navigators from the CCC, totaling 92.29 percent. These results are not surprising due to most service requests originating from these groups within the care system. Rejections often occur due to a community member deciding not to receive care, they are already enrolled in services, or it was the incorrect receiving organization. "Then, especially we cancel the service, and we put a comment in the box, like, let 'em know that family declined the service for any circumstance. So that's the way we communicate. If it is an emergency, I call the partner, and I tell them, oh, family declined the service. Thank you. You can reject the referral."

Organization	Share of Rejections
CCC - Public Health Ambassadors	7.69
CCC Navigators - 3	69.2
CCC Navigators - 5	7.69
CCC Navigators - 6	15.4

Table 4. Percent of rejected service requests from sending organizations.

Organization	Share of Rejection Rate
Religious Charity for Change	30.8
Community Health Services	7.69
Local Housing Services	15.4
CCC - Employment Support	15.4
CCC - Housing	15.4
CCC - Public Benefits Support	15.4

Table 5. Percent of rejected service requests by receiving organizations.

Rejection rate by service type is spread out more evenly across a specific subgroup of service types. Some of these service types are employment, behavioral health, housing assistance, and public benefits support, with a 15.4 percent rejection rate. Rejections occurring in these categories reflect service complexity that coincided with accessing these services compared to more immediate need service types like materials goods. A community partner describes this notion of service complexity "We receive mainly children. We cannot see anyone who is diagnosed with autism. We do not have any CBAs credentialed at this facility. That would be one that we reject just because we don't provide that service. Any other claims that we would reject, as I mentioned, if someone is on the registered sex offender list or has a diagnosis or condition that we cannot treat, or it's a service that someone is asking for that we don't provide at this clinic. Other than that, we'll accept, you know, all referrals, even when we do have a waitlist." This health provider explains how eligibility for services is associated with varying criteria and requirements influenced by the capacity to perform the services and regulations surrounding access to services.

Service Type	Share of Rejection Rate
Employment	15.4
General Behavioral Health Concerns	15.4
Healthcare	7.69
Housing Assistance	15.4
Housing Assistance, Other	7.69
Other	15.4
Public Benefits Support	15.4

Table 6. Percent of rejected service requests by service type.

Variation in this care system is shown through time to accept metrics and time to close metrics across service types. These measurements provide an in-depth view of how service types differ regarding community members accessing services. The table below shows that service types like health care, material needs, housing, and employment take significantly longer to

close. This can be explained by previous results demonstrating service complexity and the ambiguity about what it means to close a service request. A CCC data manager points to this ambiguity and says:

> "So, a closed referral could mean that the person actually didn't get connected to the services cause maybe they didn't answer, or maybe they no longer needed the services, or it turns out that they needed something different." Additionally, service complexity is illustrated through the nature of what it means to close housing requests. "Let's just say the person that is interested in the home buying process. Well, yeah, it's a process. So, we offer workshops, and I can get them, you know, I can get them to where they've created an account. Maybe they've registered for the next workshop or, you know, started the home buyers workshop, but they don't have a house yet. So, I'm torn as to whether or not I close this once they've connected with us. Do I close this after they've taken their first workshop? Or do I not close this until they actually buy a house?"

Service Type	Time to Accept	Time to Close
Behavioral Health	4	11.1
Citizenship/Immigration	6	9.8
Employment	5.7	39.4
Enrichment	3.3	13.5
Material Needs (Food/Clothes)	1.2	16.8
Health Care	12.7	29.4
Housing	5.7	14
Legal	2.7	4.2
Multiple Service Request	6.3	12.5
Public Benefits	1	12.8

Table 7a. Average number of days to accept a service request and complete a service request within service types.

Types of Users: Senders and Receivers

The first research question aims to understand the perception and characterization of case management technology use in collaboration. From the described outputs of the systems data,

different types of users use the case management technology to connect community members to care. Specifically, the distribution of service requests exemplifies that activity across the care system points to two user categories: community-based organizations that send service requests and community-based organizations receiving service requests. Community-based organizations that send service requests were primarily CCC-affiliated backbone staff and programs. Receiving community-based organizations represents a more diverse array of community partners. These user categories are important because they are connected to how community-based organizations characterize the role of case management technology in both their organization and the care system.

Qualitative distinctions among user categories also appear. Senders view technology as the primary tool to connect and communicate with partner organizations. In contrast, receivers view the technology to manage incoming service requests in addition to other platforms. Interviewees noted that receivers wanted to use the technology more comprehensively but struggled due to juggling multiple platforms and lacking organizational capacity. Nonetheless, both senders and receivers view the technology as a mode to bolster connection and relationships across the community, leading to comprehensive strategies that support care provision. Thus, care is mediated through the sender and receiver relationship. The case management technology captures this relationship's impact on community members accessing services through its metrics.

Affordances in Community-Based Care Systems

In line with the first research question, this integration of quantitative outputs from the use of the technologies and qualitative insights led to a fundamental understanding and

expansion of what these technologies afford. The qualitative analysis reinforced the literature on how these technologies support care systems' work, but using a grounded analytical approach led to an extension of what case management technologies mean in community-based contexts. As a result, preexisting affordances: referral tracking, needs identification, resource directory, and reporting and analytics surfaced as key categories (see Table 7b). These affordances offer various insights across senders and receivers.

Referral tracking refers to using the technology for longitudinal case management. Interviewees note that IRIS provides statuses for service requests as they move through the technology. On the system side, referral tracking is displayed through service request statuses like time to accept, close, rejection status, and sender and receiver organization. Referral tracking is helpful because it provides a way for care system personnel to understand trajectories of care for community members. Interviewees note that referral tracking allows them to see a community member's experience in care provision in real-time. This allows them to intervene to mitigate confusion to support connection to services. This feature as an affordance is noted prominently for senders because they are the primary users to route referrals.

Needs identification refers to the technology capturing communication about services requested and listed in the platform. Interviewees note that through IRIS, they can codify needs and converse with partners to understand what other conditions may arise for community members. In the system's data, needs are associated with service type. As conversations occur across the platform, personnel create service requests and manage those requests according to those needs. Needs identification works in tandem with community navigators and other personnel during intake. This feature as an affordance is noted for senders and receivers. Senders are the primary users and perform intake for community members and route referrals to

community partners. Receivers use referral tracking to understand care trajectories for clients with multiple needs.

IRIS serves as a resource directory. A resource directory allows care system personnel to understand at any given moment what resources are available for community use. Interviewees note that they go to IRIS to identify organizations and resources that are helpful for community members. Resources are identified as both the service type and community-based partners on the systems side. This affordance creates clarity in the care-seeking process for senders and receivers. Interviewees note that IRIS allows users to read about all the organization's services. Thus, giving the opportunity to direct more resources to community members. This feature as an affordance is noted prominently for both senders and receivers because IRIS allows partners to name and locate resources and inform service provision within the community ecosystem.

Reporting and analytics afford a care system the ability to understand outcomes of care provision. Specifically, it allows personnel to quantify how care is accessed and the rate. This is shown in the system data through metrics like time accept, time to close, rejection status, and distribution of referrals. Interviewees note that this affordance allows personnel to get the big picture of how community members access services and how technology plays a role in capturing that provision. Reporting and analytics serve as a mechanism for partners to understand their activity across the care system. This feature as an affordance is noted prominently for senders because they are concerned with the care trajectories to garner insights about service provision activities.

Nonetheless, senders and receivers note that case management technology also affords a mechanism to support community relationships and capacity building, extending past technical

boundaries into sociocultural experiences between community members and systems (see Table 7b). Interviewees note that technology builds the capacity of care system personnel leading to technical expertise and proficiencies that empower them to support community members further. IRIS bolsters connections across senders and receivers that reinforce the mission of why community care work is important and a higher awareness of community partners supporting community goals. Ultimately, this technology is a dynamic tool to reimagine people power and connection to disrupt cycles of harm.

Affordance	Example
Referral Tracking	"I use it as I receive referrals. So anytime I get an email from the IRIS notification letting me know that someone has made a referral, I log in right away to access that referral. I probably check it a few times a week to update, or when I know that an appointment we've reached a patient, especially if we didn't get a hold of the patient the first day."
	"We just make the referral and send it. And after like I said, 24 to 48 hours, we check the referral again to see if they accepted or not, submit the comment, and, or give a follow-up with the family, they call, if not, but it's easy. Through IRIS."
Needs Identification	"I log in, and I look at what they're looking for? If they're looking for English classes, I direct them to my registration. So, my enrollment specialists can connect with them and then have several points of contact."
	"I need to log into IRIS. I need to put all personal information, phone number, name, address, and I need to know what needs they have… I send the referral. And around 24, 36 hours, they respond to me, and they say, okay, we contacted this person, and this person has his next appointment next week."
Resource Directory	"I think it's the glue to everything because what we do in the meeting is we talk about the new services, all the changes, but until you go to IRIS, you can see the updates for the agencies."
	"When people think of my organization, people only think of integrated English, but then when they go in IRIS and look, they're like, oh, you also offer job training. Right. So, I feel like that's the eye-opener. It's
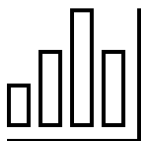
not so much like what other organizations are out there, but it's an eye-opener for like truly all of the services that organizations offer that you didn't know they did."

Reporting and Analytics

"I love seeing those visuals cause we hold meetings, and at the meetings, we can see where are these referrals coming from? And we can look at trends."

"Yeah, I think for me it's the data piece, right? So, there's a lookup tool that will give you a snapshot of a certain type of referral being made, like referrals to housing or referrals made between a certain date or referrals made by a certain navigator. Those are one of my favorite features because, obviously, I'm working very big picture. So, it's really helpful to get an understanding of what's happening."

Community Relationship & Capacity Building Tool

"But also it, it acquaints people who normally like aren't acquainted with this stuff. So, they build their own sense of capacity and agency to do the work. Right. So, one of our navigators just took it upon herself to be the one who does public benefits, referrals, and help community members walk through the process of applying for public benefits, and we know that system is designed to be tricky. So, you know, so it's harder to access. I think that to me, especially knowing her like that, comes from feeling like folks have her back and feeling like she has capacity to do it."

"I think IRIS has given me a view and like a level of optimism about what can be done effectively; the more you move outward from these like concentric circles of relationships and institutions, I believe in a system's ability to actually provide support and effective services for community members, right. It's not a pie in the sky dream that a community can be strong because a community is connected to what they need to be. Right. We've, tapped and touched into that"

Table 7b. Affordances of case management technologies in community-based systems of care.

The second research question is descriptively driven and captures how case management technology by community-based organizations mediates access to care. Specifically, mediation is understood through the computation of system metrics that showcase the ultimate impact of these technologies on communities. These metrics are time to close, accept, and share referrals

by an organization and service type. CCC enrolled 78 percent of community members into services during this period. Across the care system, the average time to accept is 1.8 days, and the average time close is 16.1 days. CCC's affiliates sent 89.8 percent of all referrals. For receiving organizations, 74.9 percent of all service requests were sent to Food Delivery Initiative (See Table 3). Healthcare had the longest time to accept, which was 12.7 days, and the longest time to close, 29.4 days. Public benefits have the lowest time to accept, one day (See Table 7a).

This variation across service type analytics reflects the co-constitutive nature of the sender and receiver relationship. Specifically, the mediation of care originates through the complexity of service type and use patterns—this mediation represents the flow of information between sender and receivers. For example, the healthcare service type has the longest time to accept. Senders and receivers note that healthcare requests require more vetting, longer waitlists, and eligibility for some requests is hard to reach. Senders apply standard system protocols and follow up with receivers. However, due to the complexity of service requests, receivers will respond as community members meet eligibility requirements or move off the waitlist. This results in a long time to care for community members.

In contrast, food requests were the majority of service requests. Due to this high propensity of community need, senders sent these service requests to users that provide food. This service type has a lower time to accept than health. This reflects the ability of receivers to respond to senders efficiently, leading to community members accessing food faster. The flow of information between sender and receiver is more straightforward and does not require extensive communication. Food is an immediate need and does not have the same red tape and complexities as other service types. Thus, mediation between senders and receivers can quickly facilitate care provision.

This study is not a study of care system effectiveness. CCCSOC sees similar variations across care system dimensions and is performing relatively well in connecting community members to services (Gibson et al., 2022; Saitgalina & Council et al., 2020). These metrics point to the co-constitutive nature of the relationship between the use of the technology by community-based organizations, community relationships, and the nuances of service delivery and integration.
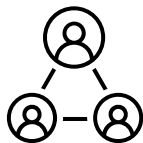
Community Navigators in Focus

Lastly, the third research question aims to identify the roles of community navigators in community-based care systems. This work provides a typology of the various roles community navigators embody to support community members in accessing services. Similar to affordance literature, the roles that navigators play in care systems have been explored, and these roles show up for community-based care system navigators. These roles are friend, motivator, external supporter, and knowledge broker. Nonetheless, a unique and distinct understanding of community navigators being community resource advocates and consensus builders surfaced as key categories through a ground approach. The community resource advocate role emphasizes the use and maintenance of community resources. Specifically, explaining to community members the importance and power of local use throughout their care-seeking process. Community navigators serve as champions of community resources and take an asset-based view of community services. The consensus builder role refers to how community navigators use information to build agreement and buy-in across care system stakeholders to mitigate and diminish confusion to support community members in accessing services (see Table 8).

Role	Example
Friend	"They have my number, they call me, they reach for my help."
	"If you ever need link card, medical card, counseling, give a call or reach out to me or come to my house or whatever."
Motivator	"I try to talk to every client. This is an amazing program we offer to the community and the way that they can make an appointment. They don't have to wait a long time, like two months, for a mental health appointment. Through the program, maybe two, maybe three weeks, but they can get an easy appointment."
	"We went door-by-door in our neighborhood, not knocking, but just letting our neighborhood know about if they wanted to join if they wanted services. We are here for them."
External Supporter	"She just needed a little bit of reassurance that it was okay to ask for help. It was okay not to have the answers right away as a parent, you know, and to accept the help was available for her. And after two cancellations, she ended up okay."
Knowledge Broker	"They call me because they need the assistance for medical or link. I guide them to do it. I also offer them the help we have for immigration and citizenship. So, I tell them, you know, there's counselors that we could refer you to if you ever need the help."
	"If I don't know information regarding different organizations or different clinics, I do my research, or I ask other navigators. We do our research together."
Consensus Builder	"We have built a relationship with the school staff, principals, and teachers. We let them know we are here in case one of the students; families need help, and we can refer them. We can make the referral. We can help them with the resources that we have in the coalition."
	"I try to make a point to ask navigators to call partners regularly and just ask for those updates. That way, before community members even make contact with navigators, they can already say the current state of services."

Community Resources Advocate	"For example, some people can be referred like 30 minutes from the south side. So, it's like, no, we have clinics around here. We can make the reverse. It's completely free."
	"They look for us, and they can come to the principal office and ask for help with rental assistant, or my family is struggling with this. So, they connect with us immediately. So, it's easier for us to make the referral. And we know about a specific partner, what they offer to the community."

Table 8. Roles of community navigators in community-based contexts.

CHAPTER 5: DISCUSSION

Care systems are interorganizational multisectoral forms that connect human service agencies to develop avenues for communities to access services (Jacobs et al., 2007; Shellhaas et al., 2016; Stout et al., 2019). These systems rely on human and technological capital to execute care system operations on behalf of partner organizations and target populations. The technological capital, in this case, is case management technologies that allow organizations to connect and share information about requested services and serve as an information warehouse that contains and explains the resources available to a particular community (Im & Grumbine, 2021; Karriker et al., 2020). The human capital is the navigation services personnel that support community members and clients in accessing services. Navigators use their firsthand experiences and expertise to mitigate barriers and create ease in navigating care (Nguyen et al., 2011).

Navigation services within care systems create an environment where clients feel safer asking for help and have an external support system as they connect with the providers and partners in the care system (Broaddus et al., 2017). This dissertation investigates how technology and navigators influence populations accessing care. Specifically, this dissertation demonstrates that these tools are perceived and used differently in community-based care systems compared to

more clinically driven care systems. This work also indicates that highlighting the tools that community-based care systems use provides a fruitful opportunity to demonstrate how theoretical and practical understandings of technological affordance and ecological systems theory can be expanded to explain various care systems. Research question one shows that two different types of users exist within community-based care systems: sender and receivers. Affordances of these technologies depend on the kind of users. Research question two demonstrates that care is mediated through the sender-receiver relationship, and service complexity impacts the flow of information between users. Research question three explains how community navigators utilize alternative roles to support care provision. This work surfaces the roles of community resource advocate and consensus builder. Additionally, this work provides an expanded typology of navigation services' role by focusing on and increasing our understanding of the function of navigation services in community-driven grassroots contexts. This chapter presents propositions that motivate a deeper understanding of these topics and future research.

A Call for Ecological Systems Theory

Ecological Systems Theory (EST) is a theoretical framework that explains how social units (e.g., individuals, families, etc.) sit at the intersection of multiple realities and experiences that influence behaviors and interactions. EST views our development as a complex web of relationships impacted by the interacting levels of our environment (Bronfenbrenner, 1992). These levels are described as five ecological systems: microsystem, mesosystem, exosystem, macrosystem, and chronosystem (Bagnall et al., 2019; Noursi et al., 2021). The microsystem is the first level and includes relationships that explicitly influence an actor's immediate environment. These relationships are parents, peers, teachers, and siblings (Hong et al., 2011;

Odom et al., 2004; Swick et al., 2006). The mesosystem is the second level and includes the interactions between the actors in the microsystem. For example, interactions between parents and teachers are interconnected and can influence one's life (Odom et al., 2004). The third level is the exosystem. The exosystem incorporates formal and informal social structures. These structures are someone's neighborhood, workplaces, and mass media (Abrams & Theberge, 2005; Hong et al., 2011). This dissertation shows that the exosystem comprises interactions and relationships within and across the case management technology. The macrosystem is the fourth level and includes the broader socio-cultural elements that have undue influence on our lives. These elements are socioeconomic status, poverty, wealth, and ethnicity. Lastly, the fifth level is the chronosystem (Swick & Williams, 2006). This level includes broad environmental experiences such as major historical and life events that influence (i.e., the COVID-19 pandemic).

These levels provide fertile ground for understanding how care systems operate. This work takes the view that care systems exist across these levels. Specifically, care system personnel and organization are embedded and interact within this complex system of relationships. Personnel such as community navigators and backbone staff are parents, teachers, and community members and support individuals and families (microsystem). The interactions across these groups influence how services are provided (mesosystem). Care systems are situated in neighborhoods and involve government agencies and human service nonprofits (exosystems). Care system personnel and target populations are navigating structural barriers like racial and economic inequality (macrosystems). Global events like the pandemic and social unrest influence how care systems operate daily (chronosystem).

Research has asked for more practical explanations and studies that demonstrate the interaction between these levels (Hill, 2021; Neal & Neal, 2013). This dissertation answers that call and zooms in on the mesosystem (navigation services) and the exosystem (case management technologies) to expand how these two levels are defined and understood. Results show the sender and receiver relationships exist across these levels and impact the ability of community members to receive services. Thus, the interaction between system users within and across technology is crucial for empirical exploration and EST development. This expansion presented in this dissertation is significant because the literature often describes the interactions that exist in and between these levels in broad terms and does not emphasize larger scale interventions like care systems (Jackman et al., 2022). Moreover, this dissertation shows that navigation services and case management technologies directly impact peoples' lives as tools to support care provision. As one moves up the levels of EST, previous research has assumed that aspects that constitute these levels have a passive or more indirect influence on one's relationships (Neal & Neal, 2013).

This work points to a different story: case management technologies are dynamic modalities that are extensions of the actors from the mesosystem. Case management technology should be understood as having the ability to represent the direct interactions between community navigators, care system backbone staff, and community members while also representing broader implications of how technologies influence development. Specifically, the use of technology is co-constitutive and impacts how communities view themselves in relation to one another. Technologies mediate our experiences with the broader social world (Cyr et al., 2015). Thus, this work supports the belief that community development exists across physical and virtual realms (Navarro & Tudge, 2022). Case management technologies can build capacity

and community resilience and reinforce systemic barriers and systems of harm (Benjamin, 2019; Yao et al., 2022). Thus, this dissertation calls on ecological system research to situate technology and technology use when describing a complex web of relationships because technologies often firmly embody these complex relationships.

Affordances 2.0

This ability for technologies to mediate our experiences connects to the affordances they purport to provide. For care systems, case management technologies allow disconnected organizations to have direct electronic communication channels to facilitate data exchange and share information about clients accessing services (Cartier et al., 2020; Lindau et al., 2016). The growth in use of these technologies is driven by hospitals taking a more social orientation and recognizing that patients need support as they access clinical care outside of the hospital. This social orientation led to connections with community-based organizations and a broader awareness of how case management technologies achieve care system goals.

Through their features, these technologies provide affordances for participating organizations and care systems to provide human services (Faraj & Azad, 2012; Hadfield & Jopling, 2014). The primary features discussed in the literature are: resource directory, searchability, client access, social risk screening, needs identification, referral tracking, and reporting and analytics. Features from IRIS observed in this study and discussed in the literature are resource directory, needs identification, referral tracking, and reporting and analytics.

First, the resource directory feature refers to a real-time and consistent overview of community resources (Cartier et al., 2020; Dunlop et al., 2016). This feature supports capturing human service needs and identifying gaps in services. Results show that senders and receivers

perceived this feature to be helpful. For senders in IRIS, it assisted with mapping community resources beneficial for service request routing. For receivers in IRIS, the resource directory provided relevant information about services from a partner organization to assist in case management. This affordance enables users to identify more routes to care for community members.

Second, searchability allows care system personnel to look through a variety of information to determine eligibility requirements for specific programs and assist in connecting populations to accurate care and lower the rate of client rejection (Rice et al., 2017). Third, CMTs can provide client access, allowing clients to oversee their service requests and communicate with the system providers (Heinemann et al., 2004; Wideman, 2011).

Fourth, these technologies provide social risk screening. This supports care system personnel in understanding the social risks and conditions associated with clients and the dangers of not receiving care. Fifth, platforms can identify needs proactively and predictively, ensuring wraparound care (Amarasingham et al., 2014). For users of IRIS, system senders find this affordance useful. Senders are the primary users that have initial interactions with community members seeking services. Senders use IRIS to identify and create care plans surrounding needs through these interactions. This affordance optimizes care provision for senders in intake processes and leads to the actualization of a wraparound care philosophy.

Sixth, CMTs allow partners to longitudinally track service requests to be aware of client needs (Rahm et al., 2007). For IRIS users, senders and receivers find this affordance beneficial because it allows users to capture real-time care trajectories. For users, this affordance mitigates gaps in care for community members as they move through their care-seeking processes. Senders

can follow up with receivers about care status through IRIS, facilitating information exchange to limit barriers to care. Lastly, these technologies can produce data exports to assist care systems in understanding trajectories of care and can be advantageous when communicating information to funders and other external parties (Carman, 2009; Yigitbasioglu et al., 2021). For IRIS users, senders find this feature valuable because it provides community-level data about senders, receivers, and community members moving through the care system. This affordance produces an overall picture of community wellness and community resource accessibility.

The affordances of these technologies and the value of their characteristics are shaped by how users perceive them and ultimately enact them (Major et al., 2022). This connection refers to the mutuality and the aptitude for users to partake in sensemaking to recognize what technology means to them and what it provides in their lives (Faraj & Azad, 2012; Hadfield & Jopling, 2014). This dissertation takes the stance that utility and usability are culturally shaped communication, representation, and sensemaking modalities. Users bring their own experiences, ideas, and beliefs from all facets of their lives (de Souza, 2005). These experiences motivate and provide heuristics to reimagine how these technologies can create impact (Gonzalez-Holland et al., 2017).

The mixed-methods approach ascertains that community-based organizations perceive that case management technologies provide mechanisms that logistically support longitudinal case management and care system goals. These technologies offer both receivers and senders a way to mobilize community resources. Community-based senders and receivers interact with different sides of the technology, and care is mediated through this sender and receiver relationship. These findings reinforce ideas about sender and receiver relationships. Specifically, this relationship mediated through technology can lead to a more robust sense of community

connectedness (Kikuchi et al., 2022). This relationship between sender and receivers motivates sensemaking about the power of case management technologies to serve as a tool to redistribute community resources and create equitable outcomes for community members.

Proposition 1. Users of community-based nonclinical care systems will perceive case management technologies as tools to create a sense of community connectedness.

The findings show how technologies are culturally shaped and lead to different categories of affordance or use. These findings indicate that users in community-driven care systems view technologies as tools to create real social impact. Specifically, CMTs affords an opportunity to build community relationships and capacity through connection and communication. Especially, when there is alignment between the goals of the community-based care system and the perceived use and purpose of the technology (Okumus et al., 2016). CMTs serve as a safety net to ensure community-wide awareness about individuals and families accessing care. If designed with people in mind, CMTs can systematize case management processes in malleable ways to ensure ease in use. This allows community-based organizations and community members to embed themselves in care system work more rapidly and create easy wins to feel motivated to serve others (Bryson et al., 2006).

This means that community-based organizations perceive these technologies as extensions of relationships they care about deeply. These technologies are tools to help repair historical trauma and remove siloes of communication to increase community buy-in and community-wide trust. These technologies serve as a mechanism for community-based care system personnel to build a sense of belonging and create a community of practice that supports continuous learning (Sharp, 2011). CMTs allow users to gain technical expertise, which extends to a broader purpose and meaning to the individual and the care system itself. Essentially, case

management technologies in community-based contexts serve as a tool for empowerment

(Zimmerman, 2000). Through participation, community personnel can delegate community

resources for community use, taking control over decision-making processes and authorities

residing in external actors (Sheperis & Bayles, 2022). Case management technologies are moved

by people.

> *Proposition 2. As community-based nonclinical care systems adopt case management technologies, the greater the likelihood that a community will increase individual-level and community-level capacity.*

The Role(s) of Community Navigators

This dissertation exemplifies that people move case management technologies. Thus, it is

crucial to center the voices and the work that care system personnel perform to support

populations in accessing services. Navigation services are a mechanism to assist clients through

facilitating communication and information exchange between care system providers and

stakeholders (Broaddus et al., 2017). These services are important because the care-seeking

process can be challenging. After all, clients often juggle documentation requests, multiple

appointments, eligibility requirements, and other life issues. Research has shown that successful

navigation services increase outcomes like clients maintaining care activities and upward

trajectories in clinal care (Desrosiers et al., 2016; Freeman, 2013; Natale-Pereira et al., 2011).

Navigation services personnel bring their wealth of knowledge and experience to motivate their

work and show up in various care system contexts. This point is important to note because this

tells us that care system goals and contexts can influence the roles that navigators play.

The literature describes and gives navigators a variety of titles and often uses them

interchangeably. These titles are community health workers, patient navigators, social workers,

family navigators, and community navigators (Kelly et al., 2019). The foundational similarity

across these types of navigation personnel is improving individuals' and communities' capacity

(Myers et al., 2017). Their experiences with populations emphasize peer-to-peer relationships as

the primary pathway to mitigate the stigma surrounding services (Rosenthal et al., 2010).

Nonetheless, this dissertation focuses on the roles of community navigators in community-based

care system contexts. This emphasis is significant because there are differences in how those

who hold these roles show up in them. When comparing community navigators to patient

navigators or social workers, community navigators use a wraparound philosophy of care (Burns

& Goldman, 1999). This means that their job is to connect and support community members in

accessing comprehensive services that help them in multidimensional ways (Stenersen et al.,

2021). This moves beyond services relative to clinical contexts. Community navigators support

historically underrepresented and minoritized populations that experience violence and unsafety

when seeking services (DeLilly & Flaskerud, 2012; Kattari et al., 2017).

Community navigators are recruited through informal, organic methods like word of

mouth and are local experts that know the realities that individuals and families are experiencing.

They reflectively represent community members by sharing similar identities and experiences in

navigating critical infrastructures supporting life (Brandt, 1978; Kelly & Lobao, 2021). These

aspects inform how the literature discusses the roles of community navigators. These roles are

often described are friend, motivator, external, supporter, and knowledge broker (Funk &

Hounslow, 2018; Phillips et al., 2014). The role of friend develops through consentient

communication with community members about their lives or previous ties (Busza et al., 2018).

The role of the motivator involves the consistent encouragement that community navigators

provide to ensure community members maintain care. The role of an external supporter indicates

the ability of a community navigator to serve as an unbiased voice outside of a community

member's family (Phillips et al., 2014). The knowledge broker role focuses on community

navigators serving as subject matter experts and facilitating information exchange across

providers (Davoust et al., 2021; Shapiro, 2020).

> *Proposition 3. As community-based nonclinical care systems emerge will assume roles of friend, external supporter, and knowledge broker to a greater degree than patient navigators or social workers.*

The findings of this dissertation reinforce the roles mentioned above that community

navigators play. However, this dissertation builds on this framework by finding two new roles

that community navigators use to support community members in community-driven contexts.

Specifically, community navigators are community resource advocates and consensus builders.

The community resource advocate role emphasizes local use of community resources.

Community-based care systems encourage a community-wide understanding of what services

exists and how they support community development (Bermea et al., 2019). This local scope

motivates how care is understood and provided in community-based care systems (Cook &

Kilmer, 2010).

Community navigators encourage them to use resources in their neighborhoods

throughout their interactions with community members seeking services. This role challenges

deficit-based understandings of community resources and uses an asset-based approach to

reframe the power of local use (Harrison et al., 2019). Local use means people power is

maintained and held by the people (Pulhin & Dressler, 2009). In this advocacy, community

members begin to increase their connection to services and what it means to be civically and

socially engaged in supporting community wellness. This role also motivates community-based

organizations to stay involved in care system activities due to consistent use of their services,

communication, and realizing that they matter and are crucial in diminishing disparities (Agdal et

al., 2019). The knowledge that community navigators have about resources in this role is

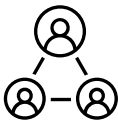transformed into collective consciousness and action to stay local.

Role	Activities
Community Resource Advocate	Emphasizes local use of resources in interactions with stakeholders
	Asset-based approach to communicate about community resources
	Motivate partners to stay active in care system work
Consensus Builder	Mitigate confusion surrounding care-seeking processes
	Research and collaboration with counterparts to create consensus strategies
	Communicate with gatekeepers to maintain sense of urgency regarding care connection

Table 9. A typology for community resource advocate and consensus builder roles.

Proposition 4. Community-based nonclinical navigation personnel are more likely to champion the local use of community resources than navigators in clinical settings.

The role of consensus builder emphasizes community navigators' ability and need to

communicate the importance of why individuals and families need access to services. This role

moves beyond being a knowledge broker because it creates buy-in and understanding

surrounding the best path to care for community members, not just sharing relevant information

(Taylor et al., 2020). Misunderstandings and confusion surrounding the urgency of care can lead

to negative care trajectories and social outcomes for community members, especially as care

looks different and is more comprehensive when it moves from clinical settings (Acevedo et al.,

2020; Hwahng et al., 2022; Mueller et al., 2015). Consensus builders leverage their community

connections and social capital to expedite connection to care. Consensus builders consistently

follow up with care system stakeholders to ensure that there are little to no gaps in what is needed to connect community members to care and mobilize surrounding the urgency o situations community members face.

Consensus builders are actively researching with counterparts to understand how services fit the dynamics of one's life. This goes back to community navigators being deeply involved with the intricacies and events of community members' life (Phillips et al., 2014). This deep relational connection motivates community navigators to show up for community members directly and energetically (Russell, 2022). Consensus builders are consistently connected with gatekeepers to resources and information to ensure that those who wield power know the potential implications of inadequate connection to services and oppressive power systems (Maclure, 2022). It is important to note that these roles are connected to the contexts in which these navigators are doing their work. Thus, community-based care systems offer different opportunities for role generation. A community-based nonclinical care system's localized and grassroots nature emphasizes a "for us by us" ethos of community ownership and embodiment (Payton, 2016). This mentality drives wraparound service provision that centers on the whole individual, the whole family, and the whole community. The consensus builder and community resource advocate roles broaden our understanding of the collective effort community navigators put forth in community-based care systems.

> *Proposition 5. Community-based nonclinical care navigation personnel will leverage social capital and connections to support care provision through consensus building to a greater extent than their clinical counterparts.*

Overall, this dissertation argues that the local context of community-based SoC influences how community navigators perform their jobs. This work highlights how community

navigators have different perceptions of community resources than community outsiders. Local use of community-owned resources for community navigators emphasizes the power to transform community realities and lead to community control. This work also surfaces higher interpersonal proximity between community members and navigators. This leads to navigators using emotional closeness to motivate action across stakeholders surrounding care provision.

Limitations

This dissertation provides a comprehensive and robust analysis of how a community-based nonclinical care system uses technology and navigation services to provide care, but some limitations are noted. First, this work studies one community-based care system. Thus, future research should pull from more community-based care systems and compare how technologies are understood. It is likely that technology is understood differently and used differently in other care system contexts. Second, the statistical metrics observed in this study are descriptively driven to paint a picture of how care is ultimately accessed. Future research should try to capture care system effectiveness across similar community-based care systems to understand how successful community-based care systems are at connecting clients to services. Lastly, this study only analyzes views from care system personnel. Although most of the participants are also community members, it would be beneficial to capture the perspective of community members accessing services to understand how they view the impact care systems create in their communities,

CHAPTER 6: CONCLUSION

Summary

As the care system approach continues to emerge for service provision, current studies do not emphasize how care system tools support care system work (Andrade & Urquhart, 2010; Tim et al., 2018). Care systems are interorganizational referral networks that coordinate care across organizations (Cartier et al., 2019). This work investigates how community-based care systems use technological and human capital to support care provision—using a mixed-methods approach; this dissertation's results highlight the critical nuances of care provision in community-based contexts. Specifically, the localized nature of community-driven care systems influences how users perceive case management technologies' ability to support community connection and relationship building. This localized nature also affects how care system personnel perceive the roles to support care provision. The local scope leads to a reconceptualization of community resources. Specifically, community relationships are developed by offering services and interagency technologies between system senders and receivers. The use of these technologies by senders and receivers also points to different understandings of the power these technologies bring to the community. Specifically, senders and receivers view affordances differently depending on the use pattern. However, both users view case management technologies as tools supporting community capacity and relationship building.

Theoretical and Practical Contribution

This dissertation provides vital theoretical and practical contributions. First, this dissertation extends our knowledge of ecological systems theory on the theoretical front

(Bronfenbrenner, 1992). Specifically, it showcases how technology is a dynamic modality and extension of interactions across systems of relationships. Thus, technologies have the power to influence how relationships evolve directly. This works calls on ecological systems theory to explicitly document and explain our increasingly technological world and the associated tools. This work demonstrates that technology mediates complex systems of relationships across the mesosystem and exosystem. Technology also serves as a starting point for those relationships and merges the physical and virtual worlds (Cyr et al., 2015). Thus, this work extends the call for research to capture how technology influences the ecosystem of relationships that support community development (Navarro & Tudge, 2022). This work provides a clear empirical example of how ecological systems theory shows up in a system of care.

Second, this work theoretically expands our understanding of the affordances of case management technologies in nonclinical care systems. Specifically, this research finds that CMTs are tools for community relationships and capacity-building across senders and receivers. CMTs provide a mechanism for consistent communication and connection. This builds a sense of connectedness across users and motivates community-driven care. Users also increase technical capacity through constant use but also develop their expertise in service type categories and the act of service provision. This work builds on the previous affordances and posits that community-based nonclinical care systems view technology to build community relationships and capacity. This work highlights how case management technologies can serve as asset-based tools to reimagine power and resource sharing in a community (Sheperis & Bayles, 2022). Additionally, the sender and receiver relationships point to the technology's ability to mediate care provision by providing an avenue for community connectedness (Kikuchi et al., 2022). Thus, users create an ethos of wraparound care (Burns & Goldman, 1999).

Third, this work extends our knowledge of the roles community navigators play. This dissertation creates a typology that adds two categories to the existing framework of navigator roles (consensus builder and community resource advocate) to explain how community navigators support care provision. The consensus builder role indicates that community navigators use their connections and expertise to create a comprehensive understanding and awareness of the importance of connecting community members to services. Specifically, this role creates community-wide buy-in across the care system and interrogates gatekeepers to ensure families receive assistance. The community resource advocate role focuses on community navigators championing local resource use. Community resource advocates take an asset-based approach and consistently communicate the importance of community use through the care-seeking process (Harrison et al., 2019). This role also emphasizes the importance of community-based organizations staying active in care system life and reinforces the importance of their role in redistributing resources. Place provides this motivation to connect with community members in meaningful ways and represent community needs. The localized nature of community-driven care systems creates this bottom-up approach to care coordination that centers on community identity. The local scope of community-based care systems motivates activities to shift power dynamics (Cook & Kilmer, 2010).

Fourth, this work centers on the voices of community navigators and care system personnel in a localized and community-driven context. This work highlights how this context motivates care provision in ways that reimagine traditional care system tools to support community learning and the undoing of harms perpetrated by community outsiders. This research demonstrates and offers propositions that emphasize how context and tools intertwine and can lead to new avenues of organizing for social change. Specifically, this context shows

that a community-based care system can embody the localized nature of its work. This means the community resources and associated tools are community-owned and malleable to community needs (Payton, 2016). Overall, this work is a resource for scholars and communities to understand how case management technologies and community navigators influence care provision.

Future Research

This dissertation provides fertile ground for four key expansion areas on theoretical and empirical fronts. First, this work offers five propositions to explore non-clinical community-based care system activities. Specifically, these propositions seek to test if case management technologies serve as a tool for community development across various community-driven contexts. These propositions also desire to test how community navigators use their unique roles to support care provision. These propositions center on the local nature of these care systems and ask future research to examine if local contexts are a mediating factor for community-driven care systems.

Second, this work sets up an empirical basis to understand care system effectiveness for nonclinical care systems. Future research should use system metrics from this work to compare community-driven care system performance across various dimensions and care system counterparts. This will allow practitioners and scholars to understand if local care systems are more effective at service provision than hospital-based care systems. Future work should also track and compare clinical outcomes for populations served by clinical and nonclinical care systems. Third, future work should gain insight from community members about their nonclinical care systems experiences. This would provide insight into how community members

perceive activities that impact their lives. Future research should also capture if community members' participation in care systems increases community members' sense of community connectedness. This can also lead to more theoretical expansions of care systems influencing community development across ecological systems.

Lastly, future research should compare how technological affordances observed in this study show up or fail to show up when communities select different technologies. Future work should capture if the system design influences how communities perceive their ability to provide resources and shift power dynamics. This work could demonstrate the potential for case management technologies to exacerbate inequalities or serve as tools that support equitable outcomes.

Local Matters for Care Provision

The COVID-19 pandemic laid bare the inequities marginalized and minoritized communities face in the United States. The pandemic exacerbated barriers to full economic, civic, and social participation. The silver lining of this pandemic is that communities are shifting to a socioecological view to mitigate and eradicate structural barriers. A socio-ecological view asks organizations to create comprehensive strategies and interventions to support community wellness (Marmot & Allen, 2014). More and more, organizations collaborate to provide a wraparound approach to human services for communities left behind. A system of care approach is now a primary vehicle for communities to mobilize resources (Bunger & Huang, 2019). Systems of care are interorganizational forms of health and human services agencies that use technology and personnel to actualize comprehensive care for communities (Jacobs et al., 2007; Shellhaas et al., 2016; Stout et al., 2019).

This work showcases a community-based nonclinical care system that uses case management technology and community navigators to support community members in their care-seeking journeys. Insights from findings highlight how a community can use a care system approach to address power dynamics through community-controlled resource allocation. This dissertation points to a future where locally-driven care systems can address historical harms through culturally competent and reflective care. The local scope is a crucial condition for empowerment that is community-determined. This scope produces a level of intimacy and familiarity between navigators and community members that breaks barriers to help-seeking and a place where technology becomes a tool for survival and resistance. A local scope motivates a reimagining of traditional care system tools to support community wellness.

Overall, this study provides a rich understanding of how community-based care systems coordinate care and avenues for future research to explore coordinated care across various contexts. This dissertation serves as a resource for scholars and practitioners to go deeper and explore service provision. The big takeaway of this work is that people move technology. This mutuality between humans and technology has the potential to mitigate barriers and historical harms, allowing communities to take control of their lives and livelihoods. If communities are in charge of their technological future, technology can serve as a tool for change.

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