Networking Albertan Literary History, 1975-1979: A Bibliographic and Social Network Analysis

by

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Abstract

Can a bibliographic network identify the major characteristics of a corresponding social network, and what can those networks reveal about Albertan literary history in the 1970s? By combining bibliometric network methods with social network analysis, this thesis attempts to answer the above questions through an exploration of Albertan literary history between 1975 and 1979. Bibliometric network studies are applied in the field of library and information studies to study the creation and distribution of texts, while social network analysis is more widely applied to a variety of situations across the humanities and social sciences. By creating networks of bibliographic data from texts created by Albertan writers in 1975 through 1979 and a corresponding social network of those same writers, this project uses comparative analysis to examine the relationship between bibliographic and social networks. These networks are also examined for new or insightful dynamics into the history of literary communities in 1970s Alberta.

Keywords: Bibliographic networks, bibliometric network analysis, social network analysis, network analysis, Canadian literary history, Albertan literary history, Canadian literature, Albertan literature

Preface

This thesis relies exclusively on data which is fully and legally available to the public and is protected by law, including Alberta's Personal Information Protection Act (PIPA). In accordance with PIPA, some data in this thesis has been anonymized to prevent the identification of individual persons.

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Chapter 1: Introduction

Canadian literature woke up in the twentieth century.

Literature by and about people living in what is now known as Canada was written well before confederation, of course, and Indigenous traditions existed long before any Western conception of literature was introduced to the Americas. But what is traditionally understood as literature in the Western academic tradition– the texts of novels, short stories, plays, essays, and poems– came into its own during the second half of the twentieth century in Canada. The period between 1960 to 1985 introduced at least four hundred new writers to Canadian literary history, including some of the most memorable names of Canadian literature such as Al Purdy, Margaret Atwood, and Mordecai Richler (Mount, 2017, p. 5; New, 2003, p. 204). Indeed, the growth of "Canadian-authored, Canadian published English-language literary books in print" between 1963 and 1972 was 250 percent, with about 1700 titles published (Mount, 2017, pp. 8-9). Compared to the 600 titles published between 1940 and 1960 (Melnyk, 1999, p. 3), this was a literary explosion, unprecedented in the history of Canadian literature (Mount, 2017).

This literary boom occured within recent history, with many who experienced it still living. Therefore, not only does the post-1950s period provide a rich landscape for literary studies, but compared to other areas of literary history, there has been little time to truly plumb the depths of this period containing a plethora of writers, texts, publishers, academic institutions, readers, and other organizations spanning worldwide. This is especially true as the field of literary studies is expanded to encompass not only close textual readings, but also diverse aspects of literary history, such as the historical study of literary figures, the publishing industry's effect on the creation of literary works or the dissemination of works via library-based metadata.

Moreover, in the decades antecedent to the CanLit boom, methods for conducting literary-based research have continued evolving. While traditional textual studies comprised of close reading techniques are still a core feature of literary studies, other methodologies have evolved with changing technologies. For instance, in 2005, Franco Moretti published the touchstone work *Graphs, Maps, Trees: Abstract Models for a Literary History*, where he posited that analyzing information collected from large book samples with statistical methods is an important and viable method for understanding the nature of diverse literary genres (Moretti, 2005; Vierthaler & 李友仁, 2016, p. 91).

Statistical analyses were being used to provoke more comprehensive understandings in literary-adjacent fields such as publishing long before Moretti, however. As early as 1965, Price was linking references in scientific journal articles with their associated papers to outline "the nature of the total world network of scientific papers" (p. 510). This is one of, if not the, earliest examples of a bibliometric network study. Bibliometrics, which is often studied under the umbrella of library and/or information studies, is "the research domain that concerns itself with the statistical analysis of bibliographic information" (Kammerer et al., 2021, p. 3). Bibliometrics are often studied using networks because they may describe similarities or affiliations between bibliographic entities (Kammerer et al., 2013, p. 4). Indeed, the use of networks and network theories are currently a major method for analysing large-scale bibliographic data, with one of the most well-known examples being the use of citation analysis to judge the supposed impact of academic works or researchers.

Social network analysis, on the other hand, is the practice of using network graphs and graph theory to interrogate social structures and relationships. In a social network, the *nodes,* or *vertices* which make up the points on the graph, may represent anyone or anything that may play

a role in a society (Wetherell, 1998). The *edges*, or connections between nodes, represent the existence of a relationship between these nodes. The relationships represented by the edges may refer to any kind of relationship, from family ties to the exchange of information, and are limited only by the data used to build the network graph. Moreover, the flexibility regarding what can be represented by a social network has resulted in the practice of social network analysis across disciplinary boundaries, especially throughout the social sciences and the humanities. However, the use of social network analysis to study literary history is especially relevant due to the deep historical ties between network epistemology and literary studies. It is currently held that network epistemology first emerged with the construction of physical networks such as railways and circuits in the nineteenth century, and was first expressed through the works of the literary figures Samuel Taylor Coleridge, Walt Whitman, and Ralph Waldo Emerson (Fordham, 2019). As such, network analysis has been intrinsically linked to literary studies from its conception and has been used in various forms to explore aspects of literary communities such as the forms of literary production and the influences on major figures as well as being used to study the internal structure of texts themselves.

The research described in this thesis is an interdisciplinary study combining these areas of Canadian literary studies, bibliometrics and network analysis. Two questions drove this project: firstly, whether the front matter of books published within certain geographic and temporal bounds can be used to identify integral aspects of a corresponding social network, such as constitutive persons, organizations, places or relationships between those objects. In other words, if the front matter of a book, including publication data, acknowledgements, dedications, and inscriptions, are analysed through the lens of a network, to what extent can the bibliographic

network reveal the characteristics of an analogous network depicting the local literary communities?

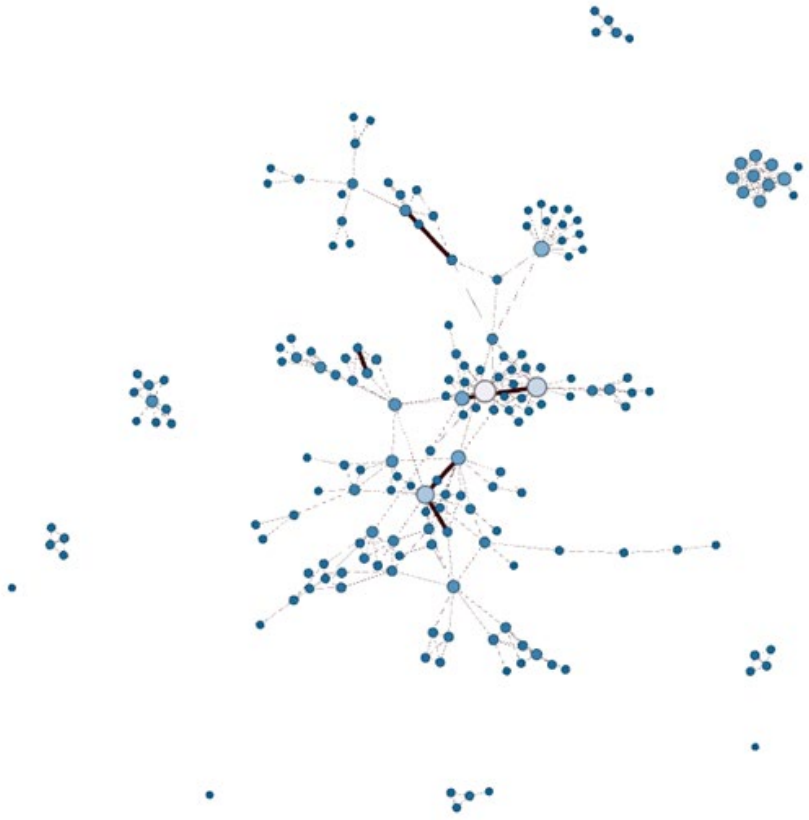
The second question behind this project is exploratory, asking more generally what these bibliographic and social networks can reveal about the communities, organizations, and people who were central to the creation and/or dissemination of Albertan literary works. For instance, can the use of network analysis identify any notable local influences on the creation of Albertan literary works that have yet to be identified by current scholarship? Similarly, what do the networks reveal about the relationships between known writers and the Albertan literary community? Because network analysis is a valuable technique for identifying and exploring multiple aspects of communities, the creation of these networks provides an excellent opportunity to explore the nature of Albertan literary communities in the 1970s.

These two questions, whether a bibliographic network can identify notable characteristics of a corresponding social network, and what those networks can reveal about Albertan literary history in the 1970s, imply another, unspoken question. Namely, is network analysis a viable method for research in the humanities and for library and information studies? In other words, can the application of network analysis to questions in these fields prove to be a valuable form of methodology? By answering the other driving questions of this thesis, it should become clear that yes, network analysis is a powerful tool for research in both the humanities and in library and information studies.

To answer the primary questions driving this thesis, the research will compare two bibliographic networks, one of bibliographic data from works published by Albertan authors in 1975 (Figure 1) and one of bibliographic data from Albertan authors between 1975 and 1979

Figure 1

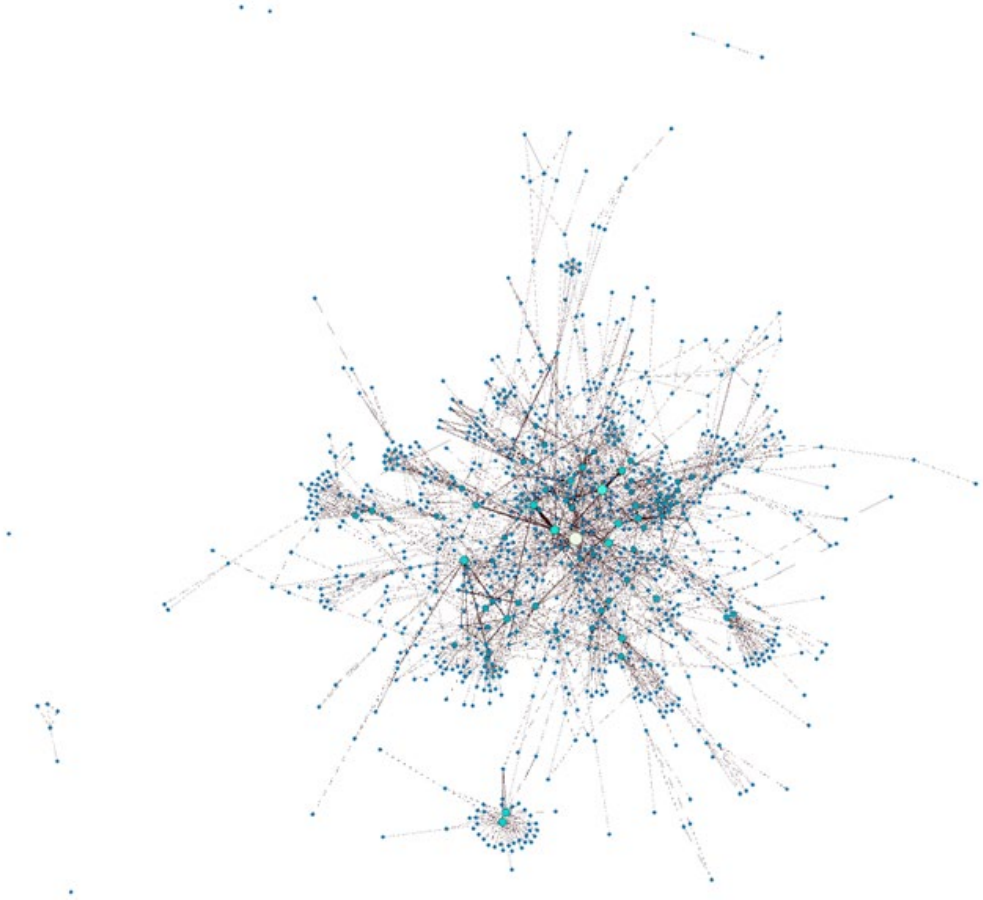
A Network of Bibliographic Data, 1975 (Preview)



Note. The nodes in this figure are weighted by degree: the nodes with the most connections are large and light blue, while the nodes with less connections are small and dark blue. Generated with Gephi.

Figure 2

A Network of Bibliographic Data, 1975-1979 (Preview)



Note. The nodes in this figure are weighted by degree: the nodes with the most connections are large and light blue, while the nodes with less connections are small and dark blue. Generated with Gephi.

Figure 3

A Literary Social Network of Alberta, 1975 (Preview)

Note. The nodes in this figure are weighted by degree: the nodes with the most connections are large and light blue, while the nodes with less connections are smaller and dark blue. Generated with Gephi

(Figure 2), with a literary social network of Alberta in 1975 (Figure 3). These networks will be compared not only in terms of the larger structure of the networks, such as density and community clustering, but also in terms of the content of the networks. For instance, how are the individual nodes of the networks, representing people, texts, and organizations, positioned in the bibliographic network as compared to the social networks? Similarly, what are the similarities

and differences between the relationships identified in the bibliographic networks as compared to the social networks? To perform these comparisons, visual analysis will be combined with a comparative examination of various network metrics.

There are a number of expectations regarding what the results of the comparative analysis will reveal. Firstly, while the bibliographic and social networks will be compared in terms of size and structure, there is uncertainty whether the structure of the networks will be the same because different kinds of data are being networked. In the case of the bibliographic network, bibliographic metadata will form the basis of the network. This kind of data is generally structured and exists within specific publishing parameters, especially compared to the data which underlies the social network. This data is likely to sprawl much more than the bibliographic data, as it represents lived experiences, rather than specifically curated information.

However, it is still necessary to compare the networks in terms of structure and size, as it is also expected that the differences between the networks will provide information about how the networks are situated in relation to each other, revealing patterns that are indicative of how the aspects of one network are represented in the other. In other words, it is expected that an analysis of the network structure will reveal patterns in how the information contained in the networks changes when it is graphed in one network as compared to the other. This will enable one to identify the characteristics of one network from a knowledge of the other network. For instance, if there is a pattern between how the placements of nodes change between the bibliographic network and the social network showing that the nodes have a larger amount of influence in one network as compared to the other, it might be possible to ascertain whether the influence of the node is changing randomly, or whether the influence of the node is being diffused across the larger network due to the difference in size. If the influence of the node is

simply being diffused between a greater number of nodes, then it becomes possible to determine the likely influence of a node in one network based on the influence that it has in the other.

The above expectations are contingent on the other hypotheses surrounding this project. Specifically, it is fully expected that the bibliographic network will identify major characteristics of the social network, especially in terms of content, especially influential people, but also places that act as hubs for publishing and networking, as well as notable organizations such as publishers and writing groups. Furthermore, it is also expected that the bibliographic network will identify relationships between the most well-connected or influential nodes in the social network, especially between writers and their colleagues and collaborators. Finally, it is also hypothesized that the social network will illuminate notable details about literary communities in Alberta. The use of network analysis to study the literary social networks of Alberta will reveal which people and organizations were not only the most connected within these communities, but those that were the most influential. However, because network analysis is a powerful method of illuminating dynamics that are not always discovered through traditional research, it is expected that some persons or organizations who are revealed to be connected or influential in the literary networks will be figures other than the writers who have been hitherto recognized as central to Albertan literary history. Thus, it is expected that the use of network analysis to study Albertan literary history in the 1970s will uncover figures whose contributions to Albertan literary history have been generally underestimated by current research.

Chapter 2: Literature Review

Introduction

The study of Albertan literature, 1975-1979, via network analysis falls under the larger study of Canadian literature as well as bibliographic and network studies. But why choose this specific geographic and temporal area to research? The first reason is purely practical: in order to conduct a bibliometric study examining whether bibliographic data can be used to identify major features of a corresponding social network, such as important persons, organizations, relationships or structural features, one must have a subject which both produces bibliographic information and is part of a social network. 1970s Alberta fills this requirement well. Not only were many works produced by local Albertan writers during this decade, but those writers often formed various social connections among themselves.

Metadata

Underlying any bibliometric or bibliographic study, including the study of bibliographic networks, is the importance of metadata. In its most basic conception, metadata is simply data that describes other data. According to one definition that was suggested by the Library of Congress, metadata can be either descriptive, structural, or administrative. In this definition, descriptive metadata refers to "information that identifies the referred entity," while structural data "defines the relations of the entity to other entities or parts of its own data, and administrative data helps managing the referred resource through information such as data formats, access rights, and history of legacy data" (Ziku, 2020, p. 3). Descriptive and structural metadata are central to the project at hand. The bibliographic data which is used to build the bibliographic network are a classic example of metadata in that the information contained in the front matter of texts is included specifically to help identify the text and to place its contents

within a specific context. However, the information used to build the social network may also be considered a form of metadata. As will be described later on, the information used to build the datasets for the social network consists of information gathered from various primary archival sources. Thus, the datasets themselves are a form of metadata which identifies information about people, places and organizations within a specific cultural and historical context.

At the same time, it is necessary to note that metadata is semantically meaningful. According to Ziku (2020), data "is the informational representation of the elements of the real world" while metadata is the "structured, encoded data about these representations" (p. 4). In other words, metadata is, essentially, a discrete piece of representational information about the world. Thus, it becomes possible to study the structures and dynamics of a society through its representation via metadata, because metadata is inherently representative of the society that is reflected in its content. Therefore, by extension, it is clear that metadata studies are of significant import to libraries, museums, archives, galleries, and other collectors of cultural heritage. These organizations, otherwise known as GLAMs, explicitly use metadata to organize, describe and otherwise curate objects of cultural importance. By recognizing that metadata carries semantic meaning, it is implied that by using metadata to describe the objects and information disseminated by these organizations, one also disseminates the meaning inherent to the metadata. Thus, it is necessary for metadata-using professionals to be aware of the nature and structure of the metadata that they use so as to be knowledgeable about the representations of the world that they are advancing.

Albertan Literary History

The specific geographic and temporal bounds applied to the subject of Albertan literature for the purpose of this thesis delineate a period of rich literary history. The 1970s were a critical

period in the development of Canadian literature as evidenced by the exponential increase of new literary writers in Canada in the 1960s and '70s (Mount, 2017, p. 5, 8-9; New, 2003, p. 204). This literary explosion was the result of several interconnected factors. While the Massey Report was published in 1951 to explore the state of, and to make recommendations regarding, the promotion of the arts in Canada, it was not until the 1960s and the excitement surrounding Canada's centennial celebration that a new state of cultural nationalism truly provoked the support and creation of the Canadian literary arts. This fervor instigated the establishment and growth of several agencies promoting Canadian writing and publication, including the Ontario Arts Council (1963), the League of Canadian Poets (1966), the Union des Écrivaines Québécois (1977), and the Writers Union of Canada (1973). In turn, these agencies, together with schools and libraries, increased the visibility of Canadian writers to the public through various writer-in-residence programs, organized readings, and other creative writing programs. (New, 2003, p. 203). Furthermore, the cultural nationalism which provoked the creation of these agencies also led to the production of various commissions and reports. The effect of these reports was the widespread establishment of Canadian literature courses in both grade schools and universities. Indeed, one report by T.H.B. Symons in 1975 "ultimately had the effect of doubling the number of undergraduate Canadian literature courses taught in the country" (New, 2003, p. 204). At long last, the study of Canadian literature was being legitimized (Melnyk, 1999, p. 47). At the same time, the establishment of various grants and other support funds also facilitated the opening of many new regional theatres across the country, which encouraged not only the production but also the writing and publication of new Canadian drama (New, 2003, p. 216). Indeed, the 1970s saw the foundation of both the Playwrights' Co-op in Toronto and Talonbooks in Vancouver, two of the largest publishers of dramatic texts in Canada (Melnyk, 1999, p. 94)

Various factors also contributed to the explosion of Canadian literature. The 1960s and 1970s saw rapid changes to both government policies and technological innovation. For instance, the 1970s witnessed a major shift in the ethnic fabric of Canadian society as government immigration legislation was altered with the aim of increasing immigration from Asia. The impact of this legislative change on Canadian literature would evidence itself in Canadian writing only a decade later. (New, 2003, p. 209). Similarly, the 1960s and '70s saw Canada opened to the rest of the world in an unprecedented manner due to technological changes in communication and travel. The development of technologies such as satellite communication and computer production methods helped alleviate the difficulty of communication across Canada's vast distances, allowing for increased interaction between people and organizations despite large distances. While this meant an increase in American influence in media, including the book market, due to the ability to easily market and transport American media, Canadian writers and publishers could also access other markets with much greater ease. As a result, Canadian writers were exposed more broadly to other societies, even while other societies were exposed to Canadian writers (New, 2003, p. 12).

The literary community in Alberta was not immune to these various changes and developments. Significant political and economic changes to Alberta in the 1960s and '70s had substantial impacts on the production and dissemination of literature and literary culture within the province. Most significantly, 1970s Alberta saw the monumental shift from an agricultural economy to one based in oil and gas production (Melnyk, 1999, p. xvii). As Alberta moved into its new role as an energy giant, funding for the arts increased exponentially, leading to the foundation of several local literary organizations and agencies (Melnyk, 1999, p. xx). For instance, the 1970s saw the launch of Hurtig, who became one of the "leading national

publishing house[s]" in Canada (Melnyk, 1999, p. 169), as well as the Rocky Mountain Books, Academic Printing and Publishing, NeWest Press, Reidmore Books, Altitude Publishing and Editions de l'Églantier (Melnyk, 1999). Even the first cookbook publisher in Alberta was founded during this period (Melnyk, 1999, p. 172). As a result, the literary scene in Alberta flourished during the 1970s. For instance, although a mere three poets had published volumes in the entire period between 1946 and 1969, by 1980, there were over a dozen new, active poets in Alberta, three of whom were presented with the Governor-General's award (Melnyk, 1999, pp. 63, 83). Finally, the Alberta Publishers' Association was founded in 1975, followed by the Writers' Guild of Alberta in 1980.

At the same time that literary production flourished in Alberta, communities were also forming between writers. For instance, it is common knowledge that professors and sessional lecturers at the University of Alberta included writers Henry Kreisel, Eli Mandel, Sheila and Wilfred Watson, Sara Stambaugh, Greg Hollingshead, E.D. Blodgett, Bert Almon, Dorothy Livesay, Matt Cohen and Rudy Wiebe. Other Albertan writers studied under these instructor-writers, including Robert Kroetsch, Aritha van Herk, Leona Gom, and Caterina Loverso Edwards. Other writers also worked or studied at the University of Calgary or the Banff School of Fine Arts, including Wilfred Watson, Rudy Wiebe, W.P. Kinsella, and Marie Jakober, W.O. Mitchell, and Wilfrid Eggleston (Melnyk, 1999).

At the same time, many writers formed both personal and professional relationships outside of educational institutions. For instance, Eli Mandel and Henry Kreisel knew each other well enough to joke about each other in speeches, Greg Hollingshead took a road trip with novelist Matt Cohen while Douglas Barbour and Stephen Scobie researched and wrote collaboratively, as did Charles Noble, Jon Whyte and John Thompson, and Candace Jane Dorsey and Nora

Ambercrombie (Melnyk, 1999). These relationships carried into the publishing field. The editorial board of NeWest Press, founded in 1977, included Rudy Wiebe, Robert Kroetsch, Henry Kreisel, Aritha van Herk, and Douglas Barbour (Melnyk, 1999, p. 173). When the periodical *White Pelican* was first published by Sheila and Wilfred Watson, its editors included Stephen Scobie, Douglas Barbour, with contributions by E.D. Blodgett, Miriam Mandel, Charles Noble and Jon Whyte (Melnyk, 1999, p. 179).

Finally, some of the largest literary organizations in Alberta were either established or run by writers active during the 1970s. For instance, the first president of the Writers Guild of Alberta was Rudy Wiebe, while the first board members included writers such as E.D. Blodgett, William Latta and Christopher Wiseman. Similarly, the first board members of the Alberta Foundation for the Literary Arts in the early 1990s included writers Aritha van Herk and Rudy Wiebe, as well as Kathy Shute, who co-founded Treefrog Press in the 1970s, one of the original publishers associated with the Alberta Publishers' Association, founded in 1975 (Melnyk, 1999, pp. 184, 187).

Thus, the 1970s were a period of rich creation and development for Albertan literary culture, making it an ideal period for meticulous historical research. Specifically, the close connections between the many local writers and their texts provide an excellent opportunity to study this community through the lens of the network, both socially and in regard to the bibliographic information contained in the numerous works they created. But what is network analysis, and how does it relate to bibliometric research and literary studies?

Social Network Analysis

The Nature of Networks

Network analysis is a powerful tool for researchers due to its ability to uncover dynamics and patterns that would otherwise remain hidden (Whitley, 2017, p. 288). For example, Dluhošová (2020), used network analysis to discover that large literary ruptures in Taiwan were not immediately produced by major post-World War II political events as was previously believed. As such, networks are widely used to "interrogate social dynamics" (So & Long, 2013, p. 157) by providing excellent models both "*of* and *for* complex processes of cultural exchange and hybridization" (Shaefer, 2015, p. 143-44), that is, of the manner in which cultures both participate in a flow of exchange, but also transform each other over time through these exchanges. Because the use of networks provides researchers with perspectives that are not readily observable, many disciplines have developed a "shared impulse" for using network analysis to describe or discover previously unobserved dynamics (Whitley, 2017, p. 288).

But what is a network? In its simplest form, a network is simply two or more connected elements, with the term 'network' referring to the whole structure of connected elements (Fordham, 2019; Levine, 2015; Schaefer, 2015; So & Long, 2013). To describe these elements, the terms *vertices* or *nodes* are used, while the connections or relationships between the elements are called *edges* (Fordham, 2019, pp. 4; Shaefer, 2015; So & Long, 2013). The nature of the edges, or relationships, between nodes varies widely depending on the context. For instance, an edge might represent a transfer of resources, a shared association, or a biological link (Wetherell, 1998, p. 127). What relationship is represented depends on the nature of the subject and the data used to build the network. The commonality between all these points of analysis is a focus on the structure and nature of the relationships between the nodes in a network.

This emphasis on relationality is foundational to analysing and understanding a network and as such is an underlying assumption in many influential network theories (Pachucki & Breiger, 2010, p. 208). One such widely applied theory of network analysis is Mark Granovetter's "strength of weak ties". It was first introduced in 1973 and its application continues to the present day. This theory simply states that "our acquaintances (*weak ties)* are less likely to be involved with one another than are our close friends (*strong ties*)" (Granovetter, 1983, p. 201). In other words, weak ties may act as bridges between different segments, or clusters, in a network which are themselves bound by strong ties. As a result, resource transfer, such as exchanges of information or ideas, may flow through weak-tie bridges and create an exchange that would not have otherwise taken place (Granovetter, 1983, p. 228-29). Today, this theory is widely applied to the practice of network analysis, and thus is extremely influential in how networks, especially social networks, are analysed and interpreted. Due to this ability of networks to visualize and analyze relationships and various forms of societal exchanges, network analysis is widely used to research various aspects of societies, from interpersonal dynamics to processes of production. As such, literary studies have often been studied through the lens of the network. Indeed, literary studies and network analysis share a rich history of parallel development.

Network Analysis and Literary Studies

The study of network analysis in the context of literary studies originally fell under a branch of study called the sociology of literature. However, although the sociology of literature is alive and well in its aim to articulate "the social logic of literary texts and practices" (English, 2010, pp. v-vi), it is rarely referred to as "the sociology of literature" in current practice (English, 2010). The term was used with normalcy in the 1970s and '80s, when figures well known for their work in

both sociology and literary criticism such as Raymond Williams, Richard Hoggart and Stuart Hall were highly visible. However, in the intervening decades, the institutional division between literary studies and sociology as respective members of the arts and sciences led to a perceived difference in research goals and methodologies (English, 2010). In the present, few people claim to study "the sociology of literature" or sociological literary studies (English, 2010). Nevertheless, the use of social network analysis in literary contexts has deep roots in both sociological and literary studies as both fields have informed the theory and methodology underlying literary network studies.

Today, there are many theorists who say that we live in a network society or culture. Researchers often work within this theoretical landscape and study the world through the lens of the network. This perspective is sometimes referred to as "network thinking". Tracing the history of network thinking alongside the history of literary criticism as it pertains to network analysis is a valuable way of understanding the current modes of thinking and methodologies surrounding literary social network analysis. Current research holds that network thinking emerged out of the nineteenth century when physical networks such as the railroad and circuits were being widely adopted (Fordham, 2019, p. 5). The concept of the network as a metaphor was first used at roughly the same time that these technologies were becoming widespread. In 1817, the poet Samuel Taylor Coleridge wrote about the way property "constitutes an abstract network that holds society together" (Fordham, 2019, p. 5). Similarly, it has been said that both Walt Whitman and Ralph Waldo Emerson displayed such obvious network thinking in their works that it is argued that network epistemology has both informed and been informed by nineteenth-century American literature (Schober, 2014, p. 495). This new mental schema appeared at just the right moment to experience pervasive popularity. The United States was experiencing a

massive shift in political and material life in the nineteenth century, while the metaphor of the network suggested "a sense of virtual cohesion" (Schober, 2014, p. 515). In turn, this metaphor found its way into the transcendentalist literature of Whitman and Emerson, not as a way of representing "relational complexity" but rather as a method of bridging the distinction between the material and the spiritual, nature and culture, self and community (Schober, 2014, pp. 516-17). Indeed, Emerson went so far as to state that English law was no more than a "discourse of fictions," that is, a metaphor (Fordham, 2019, p. 5). These early representations of "narratives of the network" informed the later narrative of the modern network society (Schober, 2014, p. 517). Thus, literary studies and network studies have been linked almost since the genesis of network thinking.

As network thinking continued to gain traction at the turn of the twentieth century, literary criticism began moving to fold its understanding of critical history into "a larger history of society in general" (Gavin, 2012, p.31). This resulted in a notable shift from the common nineteenth century literary concerns to a new understanding of literary culture and history through accounts of their transformation across time (Gavin, 2012, p. 31). Leslie Stephen clearly articulated this move in his 1903 lectures English Literature and Society in the Eighteenth Century where he claimed that "adequate criticism must be rooted in history" and that literary history was "subordinate" to the whole structure of society, including "the political, social, ecclesiastical, and economic factors, and their complex actions and reactions" (Stephen via Gavin, 2012, p. 31). Thus, one of the two major branches of twentieth century literary criticism became firmly established for the next several decades. By the 1950s, notable literary critics such as Arnold Hauser, Ian Watt and Jürgen Habermas were quoting Stephen in their work (Gavin, 2012, p. 31).

During the period of literary criticism after Stephen literary network analysis as it is recognized today was first practiced. For instance, Caroline Spurgeon, a well-known Shakespearean critic who was especially active in the 1930s, identified stylistic consistencies in Shakespeare through the use of statistical tools to track word usage (So & Long, 2013, p. 150). At the same time, Kenneth Burke, in his work *The Philosophy of Literary Form*, "posited a "statistical method" for breaking down literary texts into discrete aesthetic components" (So & Long, 2013, p. 150). Similarly, the study of bibliography evolved with R.B. McKerrow's seminal *Introduction to Bibliography for Literary Students* (1927), providing a new framework for the study of text production and dissemination by introducing the study of bibliography (Gavin, 2012, p. 33).

By the 1970s, literary critics as well as sociologists and anthropologists were often using network analysis to study social, economic, and political structures (Wetherell, 1998, p. 126). Not only was the paradigm of the computer as a network gaining widespread traction, but the data necessary for generating networks was significantly easier to attain with the advent of widespread computer processing (Fordham, 2019, p. 5). At this point, researchers were regularly studying the world through the lens of relational network ties rather than through the traditional hierarchical structures as expressed by differences in attributes such as education, age, and wealth (Wetherell, 1998, p. 128). This was the period during which the "sociology of literature" became a common area of study, especially within British cultural studies (English, 2010, p. vi).

However, the institutional view that literary studies was concerned only with qualitative analysis while sociology was concerned with quantitative analysis led to a deep rift of perception between the disciplines (Barnwell, 2015, p. 555). As a result, the study of the "sociology of literature" died off under that name in the antecedent decades. Despite this, sociological studies

of literature continued to thrive as a valid and popular practice (Barnwell, 2015, p. 556) and the combination of sociological and literary research led to many of the mixed methodologies currently employed by researchers in the field of literary social network analysis, including aspects of information theory and network computing (Hensley, 2015, p. 368). Indeed, many researchers still believe that qualitative and quantitative approaches to literary studies are complementary rather than oppositional. For instance, in 2014, Schich et al. wrote that "we need quantitative methods to identify statistical regularities, as well as qualitative approaches to explain the impact of local deviations from the uncovered general patterns" (p. 558). In other words, qualitative and quantitative approaches to the study of literature and literary history are necessary because they complement each other. They inform each other by uncovering information and introducing lines of thought and analysis that would not be recognized without the other. Network analysis provides excellent methods for combined qualitative and quantitative research. Network analysis is quantitative, in the sense that algorithms and mathematical visualizations are used to discover patterns and differences among the data, but it is also qualitative in that the patterns that are uncovered must be studied with close readings or research to avoid more than a surface reading of the possible implications of patterns revealed through the network. Thus, network analysis is often used in mixed-methods sociological and literary research.

Today, literary network analysis is regularly used to interrogate and analyse social dynamics such as cultural negotiations and processes of exchange (So & Long, 2013; Schaefer, 2015), although with a somewhat altered view of the history and context that social networks operate within compared to the earlier days of network thinking. Previously, network theory operated in the context of the "black box" view of history, which was one of the prevailing

metaphors for history and society in the twentieth century. In this theoretical framework, society and its innovations are all “cultural symptoms of their own moment” (Felski, 2011, p. 575). In other words, everything created within a societal context is created within a temporal geographical framework, which defines a creation by its time and place (Felski, 2011, p. 575). Thus, history is a container (the “black box”) which encases historical events and works of art. Numerous attributes are assigned to this box by the critic, such as political or religious ideology, economic structures, or cultural beliefs. Works of art are subsequently studied through the context of the relevant box, by attempting to determine how the box’s attributes are expressed in that work (Felski, 2011, p. 577). To understand a text, one need only clarify “the details of its placement in the box, highlighting correlations, causalities, or homologies between text-as-object and context-as-container” (Felski, 2011, p. 577). This results in the perception of cultures as self-contained, where they become nothing more than a series of stacked containers (Levine, 2015, p. 21). As a result, literary and cultural studies found themselves locked in arguments of dichotomies, such as “text versus context, word versus world, [and] literature versus society and history" (Felski, 2011, p. 576).

Such dichotomies do not align with network thinking, where the world is visualized as a network. Networks usually sprawl, expanding exponentially simply by linking new nodes to ones that already exist in the network (Levine, 2015, p. 122). This is not to say that networks do not have form or structure, of course, as even the largest networks exist within limits or bounds. For instance, rules govern how and where two nodes are linked, such as the rules determining the structure of familial roles, which directly inform the way families are linked in a network (Levine, 2015, p. 122). However, networks are also not neatly contained within boxes of history, society, or self-contained cultures; instead, they, like history and society, exist within “the

ongoing connections, disconnections, and reconnections between countless actors," all of which exist temporally as well as spatially (Felski, 2011, p. 579).

To account for the interconnected nature of most networks, many network analysts have turned toward actor-network theory and the work of Bruno Latour. Actor-network theory is a network analysis framework that is largely based on the work of Latour, first outlined in his book *Science in Action* (1987) and continually developed by Latour and others through to the present day (Luckhurst, 2006, p. 4). Although actor-network theory was originally developed for scientific and technologically based fields, Latour's work is marked by a desire to operate outside of the rigidity of university disciplines, a desire which arose from the belief that "the world is not safely divided between society and science, politics and nature, subjects and objects, social constructions and reality" (Luckhurst, 2006, p. 4). Instead, Latour's work is premised on the understanding that the world "is populated [by] increasingly strange hybrids… that cut across these divides and demand new ways of thinking" (Luckhurst, 2006, p. 4). In other words, Latour's work (and thus actor-network theory) is based on the dissolution of formal boundaries around academic disciplines as well as the dismissal of the black box theory of history. This leaves significant room for actor-network theory to transcend the bounds of science into the humanities where it is often used in literary, sociological, and anthropological studies.

Much of network-actor theory's appeal to humanities and social science research is the fact that nodes in networks can be both human and non-human (Felski, 2016; Hensley, 2015; Jensen, 2020; Latour 1996) as compared to traditional network analysis in which nodes were either all human or all non-human. Within actor-network theory, nodes are referred to as "actors" and actors may be "anything that makes a difference" (Felski, 2016, p. 748). Thus, an actor in a network may be a person, such as an author or a producer, an institution such as a publishing

house or magazine, or even something more nebulous such as a historical movement (Hensley, 2015, p. 360). Because of this wide definition of what constitutes a node, actor-networks provide an excellent space for exploring the dynamics and potentialities of non-human actors such as ideas and texts, and the relationships of those texts and ideas to pre-existing disciplinary formations (Jensen, 2020, p. 230). In other words, the effects of not only the people in a network, but also of actors such as institutions and texts, may be analysed within the bounds of actor-network theory. Therefore, through actor-network theory, literary studies, which concerns itself in various forms with texts, authors, publishers, text production, readers, and so forth, has a means of examining how these various elements interact with and influence each other, both quantitatively and qualitatively. As such, actor-network theory is a widely applied framework when social network analysis is utilized in literary and historical studies, and is the prevailing framework applied to the network analysis conducted throughout this thesis.

Additional Theoretical Frameworks of Network Theory

However, as with any other epistemological method, a variety of frameworks holding alternative understandings of the foundational nature of networks exist. It is necessary, therefore, to provide at least a brief overview of some of the most influential of these frameworks to ensure a more comprehensive understanding of network theory as a whole. The first general framework which is often used to understand network theory claims that networks are not objective or tangible forms or structures, but instead exist primarily as mental schemas, or metaphors (Kilgore, 2013; Schaefer, 2015; Wulfman, 2014). This concept of the network as a metaphor is best explained through Albert László Barabási's example of the World Wide Web (Barabási via Kilgore, 2013, pp. 39). Barabási explains how the World Wide Web is a network where web pages are nodes and hyperlinks act as the edges between the nodes. And yet, in this conception, web pages are

not literally physical nodes or vertices, but rather alphanumeric sequences delineating what should be displayed when and how by a machine. Thus, describing the internet as a network and imagining hyperlinks as edges and web pages as nodes is to project the schema of the network onto the World Wide Web (Barabási via Kilgore, 2013, p. 39). In the same way that the internet 'network' does not exist as a tangible entity in the physical world, other conceptualized networks also do not exist as objective structures in this framework. Instead, networks are mental structures that one imposes on the world to make sense of it.

Similarly, data do not speak for themselves. When analysing a network or data structure, and describing what the data are 'saying', one imposes meaning on the data (Wulfman, 2014). How so? Networks, especially visualized networks, are almost always constructed using software which imposes algorithmic order on the gathered data. While it is tempting to claim that networks only link what was already inherent in the data, this is not necessarily true. Linkages arise not only from within the data, but also from correspondences created by the algorithmic filters used to filter and structure the data within the network schema (Wulfman, 2014, p. 97). Thus, meaning may arise not only from within the data but may also be imposed by the researcher via the software and/or algorithms used to understand the data.

However, that networks exist as metaphors and that algorithms may impose meaning on data does not mean that a network cannot be a useful analytic tool for understanding linkages and communities in ways that would be otherwise unavailable (Wulfman, 2014, p. 108). Instead, it means that one must be conscious of the fact that a network does not necessarily directly correspond with an objective aspect of the physical world and thus results should be supported by other forms of research. Network analysis is part of a larger, "iterative, trial-and-error" process in the search for knowledge (Clement via Whitley, 2017, p. 302) that is meant to

generate ideas and prompt “new avenues of inquiry” as opposed to providing conclusive arguments (Whitley, 2017, p. 302). In other words, according to these frameworks, networks are best used as a tool to provide new lines of thinking, rather than being treated as fully independent knowledge structures.

However, while it may be compelling to argue that networks are metaphors which people use to interpret data rather than objective knowledge structures, these arguments have not prevented researchers and theorists from across a range of disciplines, including literary and bibliographic studies, from successfully using networks and network theory to conduct research and understand data in a manner than may be practically applied to a range of situations, such as those described below. While it is likely true that researchers impose some form of meaning on their interpretation of data through their own biases, data and information must be interpreted in order to perform research and reach conclusions. Indeed, in the second century BCE, the historian Polybius already "understood that mere facts are useless except through their interpretation" (Durant, 1939, p. 615). Thus, even if networks are only metaphors, they are still useful tools for understanding and interpreting various aspects of the world, and as such, may be treated as knowledge structures as objective as any others used to interpret and make sense of data and information.

Network Theory in Practice

Today, social network analysis is frequently applied not only to the study of literary texts, but also when researching historical literary communities and the creation and dissemination of texts. In the Canadian context, Anouk Lang demonstrates the application of social network theory to study the publication of modernist little magazines in Canada and Australia. In doing so, Lang solidifies the current understanding of how gender and production conditions directly

influenced knowledge and interpretations of the modernist movement and its development (2006). By studying the social networks of F.R. Scott and Judith Wright, Lang corroborated the currently held view that the little magazines, which were so often instrumental in the publication of modernist literature, were almost exclusively managed by men, with women receiving either a restricted role or being altogether excluded which in turn affected current understandings of modernist literature and literary production in Canada and Australia (Lang, 2006, p. 413). While the outcomes of this study are not particularly ground-breaking, the study itself is an example of one of the only existing network studies with a focus on Canadian literary history. As such, one may note ample space remains to explore the field of Canadian literary history through the framework of social network analysis.

However, examples of the application of network analysis to literary history from alternative geographical origins exist in abundance. For instance, Edward Whitley's 2017 study *Networked Literary History and the Bohemians of Antebellum New York* is an example of a study which maps a historical literary community and analyses it as a means of reframing "the impulse to structure authors, texts and aesthetic practices into stories of progressive change over time" (p. 287). To map the antebellum community, Whitley uses data derived from a digital literacy project called *The Vault at Pfaff's*. The resulting visualized social network challenged the mainstream perception of the antebellum literary community, prompting Whitley to research the publications of Walt Whitman's contemporaries, both supporters and detractors (Whitman was a member of the antebellum community). As a result of this research, Whitely concludes that Whitman's publication of *Leaves of Grass* in 1855 does not represent a singular passing moment in American literary history as was previously believed. Instead, its creation was influenced by a matrix of "interrelated episodes" (2017, p. 301), demonstrating the interconnected and impactful

nature of the antebellum literary community on American literature. Moreover, this study also demonstrates the provocative nature of network studies, in that the results of network analysis often provoke further research, in this case, Whitley's further research into Walt Whitman and *Leaves of Grass*.

Similar research was conducted by Catherine Medici in 2018, in this case using network analysis to gain a more comprehensive understanding of women's networks in the Early Modern period. Medici's research seeks to highlight the role of women in the Sidney family by tracking both social connections and correspondence to locate the position of these women in a network which is both familial and political. This network, she speculates, will illuminate the nature of societal roles for women in similar social situations in early modern history.

There are many other instances of literary-based network research being conducted. Elford (2015) uses network analysis combined with machine reading to explore connections related to the nineteenth century periodical *Fabian News*, while Johnston (2020) studies Alice Corben Henderson's poetry network in Santa Fe, New Mexico. Huan He (2020) researches the transpacific networks of Theresa H.K. Cha and Craig Santos Perez, Knights (2005) interrogates the ideological networks surrounding John Starkey in seventeenth-century England, and Lee (2017), maps writer's networks in Korea between 1917 and 1927.

Most notable, however, are the multiple studies combining network analysis with bibliometrics to study literary history. Analyzing bibliometric data through the lens of the network is a frequent occurrence. As noted previously, the first study using bibliometric data in a network to analyze trends was published by Price in 1965. Today, such studies are relatively common both in the areas of information studies and literary studies. For instance, Mangas-Vega, Gómez-Díaz & Cordón-García (2016) collected the bibliographic metadata of catalogued

works on the databases Web of Science (WOS), SCOPUS, LISA, and LISTA, hosted by academic publishing powerhouses Thomson Reuters, Elsevier, ProQuest, and EBSCOhost, respectively. By collecting articles catalogued under various terms, fields (Keyworks OR Subject OR Title), and dates, they were able to build social networks to analyse for various facets regarding the development and current state of academic self-publishing. (Magas-Vega, Gómez-Díaz & Cordón-García, 2016). Similarly, Maltseva & Batagelj (2019) use both citation data and bibliographic descriptions from journal articles housed in the WOS Clarivate Analytics database to create multiple social networks with the aim of examining how the study of social network analysis has developed over time (Maltseva & Batagelj, 2019).

It is not uncommon for current research to combine the methodologies of these types of bibliometric studies with literary and publication history. One example of this kind of research is by Dluhošová (2020). The author intended to study how various major political events such as the end of World War II and the beginning of the White Terror in Taiwan impacted the development of the Taiwanese literary field (Dluhošová, 2020, p. 275). To conduct this research, the author analysed data from the publication catalogs for literary periodicals as well as various supplements published between 1940 and 1953 via social network analysis (Dluhošová, 2020, p. 275). By doing so, Dluhošová discovered previously overlooked structural patterns which suggest that the major political events studied did not interrupt the production of literary works in the manner suggested by previous research; the Taiwanese literary field was significantly more resilient to political upheaval than previously believed (Dluhošová, 2020, p. 298).

Similarly, Vierthaler & 李友仁 (2016), use bibliographic data from digitized library records to evaluate printing trends in late Imperial China. Library and archival holdings have been increasingly digitized, which generates “extensive metadata” (p. 88), consisting of any

identifying or descriptive information that might be relevant for categorizing a work, such as author, title, dates, publishers, illustrator, topical subjects, etc. Moreover, these records are increasingly published online via holdings catalogues designed for easy user access and engagement. Arguably the largest of these online catalogues is WorldCat, an aggregate records catalogue which contains around two billion records from libraries and archives across the globe (WorldCat, n.d.). Using WorldCat catalogue records, Vierthaler & 李友仁 (2016) created a "large-scale bibliometric dataset" (p. 102) consisting of records from texts created between 1550 to 1799 which they statistically analyzed using social network analysis (p. 87). The results of the quantitative analysis were integrated with other known research on the genre, which confirmed their hypothesis that throughout the Qing dynasty the size of novels was consistently decreasing (p. 87).

Finally, Brown et al. (2017) use the front matter of texts created during the Spanish Golden Age to create a dataset to build a network model of publication networks (p. 709). The front matter of a text includes various types of information, including not just the people, but also the institutions and places that were involved in the text's creation (p. 709), the same information that is typically used to create holdings records for libraries. Through the statistical analysis of these datasets using social network analysis, the authors attempted to answer questions such as whether publishing during the Spanish Golden Age was "primarily a local phenomenon, or did it transcend geographic bounds?" and "did individuals form communities around the processes of publication?" (pp. 709-10). By creating a social network from the data and visualizing it using Matplotlib and Python libraries such as Pandas, various aspects of Golden Age publication communities were illuminated, such as how publication was often gatekept by specific individuals in specific regions (pp. 709, 713).

Like the examples above, this thesis also combines bibliometric and social network analysis to visualize and analyse a specific facet of literary history. By creating networks from the bibliometric datasets gathered from texts created in Alberta between 1975 and 1979, this thesis will examine whether the bibliographic front matter from modern texts can be used to identify the major characteristics of a corresponding social network as well as analyse the networks to see what they can reveal about Albertan literary history in the 1970s.

Chapter 3: Methodology

Introduction

Can bibliometric networks built on the front matter of books published in 1970s Alberta identify major features of a corresponding social network? And can the subsequent study of the networks created to answer this question reveal anything new or otherwise notable about the literary communities of Alberta in the second half of the 1970s? Generating the networks required to answer this question necessitates compiling two datasets: one dataset of bibliographic material from books published by Albertan authors in the 1970s and a second dataset compiled from historical sources which reveal relationships and linkages between these authors and their communities. These datasets will be used to generate networks which will in turn be subject to visual and metric analysis. However, before beginning any process of data collection or analysis, it is necessary to define the specific parameters demarcating the research being conducted.

Project Scope and Parameters

As mentioned previously, network structures often sprawl and grow exponentially. For this reason, specific boundaries were drawn around the research being conducted for this project in order to keep it to a scope reasonable for one person conducting a masters-level thesis. The boundaries set around this research are primarily temporal and geographical.

Temporally, the bibliometric aspect of the research is limited to the years 1975 through 1979. As noted previously, the entirety of the 1970s were a period of active literary creation in Alberta. However, while creating a social network encompassing the entirety of that period would have provided a more comprehensive perspective of the literary community in Alberta, researching a time period that large would have required exponentially expanding the size of the datasets to research. As it stands, simply compiling the bibliographic information collected from

texts written between 1975 and 1979 revealed 950 individual members of the network, not including possible members of the social network. Therefore, to limit the scope of the project to a manageable size, the period researched begins with the year 1975. This was the year that the Alberta Publishers' Association was founded, and thus represents a period when literary creation is not only established and flourishing but is expected to continue into the future. Therefore, in order to answer the question of whether a bibliographic network can predict a social network, two datasets were created from bibliographic and archival primary sources originally created in 1975. These datasets were used to create both the bibliographic and social networks used for the comparative analysis to answer the question regarding the predictive ability of the bibliographic network.

However, the bibliographical dataset was also expanded from 1975 until 1979 in order to keep the scope of the project wide enough to search for developments in these literary communities. Change does not happen at once but requires time to develop. Therefore, expanding the time period allows space for changes to reveal themselves through the data in order to tease out a more nuanced understanding of the networks. While this expansion does not include the social network, as researching the full five years of actors in relation to the bibliographical network would have seriously exceeded the scope of the project, the elements of the social network in 1975 can still be used to explore the nature of linkages and relationships within the larger bibliographic network.

Geographically, the bounds for the research are limited to Albertan authors and texts. When analysing the creation of texts from within specific geographic bounds, however, it is necessary to establish whether geographic proximity is an important consideration for the creation of those texts. In other words, does it matter that the texts under consideration were all

written and/or published within the same geographic area? Will geographic boundaries affect the structure of literary communities or the transmission of knowledge? These are especially pertinent questions in our era of mass communication and travel; today, people often claim close ties, both personal and professional, with people who may be geographically removed even by entire continents.

Current scholarship argues that yes, geographic proximity is a significant factor in the diffusion and creation of knowledge (Abramo et al., 2020; Capello & Caragliu, 2018). Multiple studies have revealed a strong linear relationship between the geographic proximity of academic researchers and the citations exchanged between these researchers and their institutions (Blenzon & Schankerman via Abramo et al., 2020; Borner et al. via Abramo et al., 2020; Capello & Caragliu, 2018). Researchers who are situated in close geographic proximity to each other create significantly more research together and reference each other far more frequently than do researchers who are geographically detached. This is true on multiple scales as not only does knowledge diffusion decrease significantly when the measure of knowledge flows outside of continental Europe are compared to those within Europe, but the diffusion of knowledge between American universities is also impacted by distance and state borders, despite existing within the same country (Abramo et al., 2020, pp. 3, 8). While the impact of geographical distance may be explained by various factors, it is proven that quantitative measures of knowledge diffusion and production are clearly impacted by geographical distance.

Although these studies focus on the production and diffusion of purely academic knowledge, the results suggest that geographical proximity will also affect other text-based knowledge communities (Abramo et al., 2020; Capello & Caragliu, 2018). Thus, it is reasonable to hypothesize that it is likely that texts produced in a geographically bound area will be

impacted by those geographical boundaries which will in turn affect the manner in which communities form around the creation of those texts. As such, the texts chosen to create the bibliographic datasets which were used to generate the networks studied in this thesis were chosen based on their geographical boundaries. Specifically, the texts chosen were written by authors who were currently residing in Alberta at the time of publication or spent a significant part of their life in the province.

However, limiting the bibliography of texts used to conduct bibliographical research to Albertan writers requires one to answer the question of what makes a writer "Albertan"? Does it refer only to writers who lived their whole lives in Alberta and published through an Albertan publisher? What about those who moved to Alberta only as adults, and did not spend their formative years here? Or what about writers who grew up in Alberta, with all the associated formative experiences, but left later in life? As with any question of identity, the matter is complex, with various facets. However, in order to limit the scope of this project to a reasonable size, a consistent distinction must be made between writers who are Albertan and non-Albertan. Thus, it must be noted that the definition of Albertan used here is a matter of necessity, and not chosen with the intention of minimizing the identity of those who might identify as Albertan and yet fall outside the scope of current parameters.

The parameters used to define what constitutes an Albertan author for the purpose of this thesis draws on the work of Melnyk (1999) and Strathern (1982). Like Melnyk, this study defines any writer who has "resided in Alberta for a significant period of time" (p. xx) as an Albertan writer. At the same time, writers born in Alberta "whose entire careers were unrelated to the province" (Strathern, 1982, p. ix) are excluded. Thus, if a writer was born in Alberta but never made any effort through their writing or career to contribute towards the identity of

Alberta, such as by providing any kind of interpretation of the province in their work, they are not considered an Albertan writer for the scope of this project. At the same time, a writer who was not raised in Alberta but contributed towards local literary communities and provided a literary interpretation of Alberta in their work, is considered an Albertan writer for this project. Finally, to be considered an Albertan writer for the sake of the bibliographical aspect of this research, the writer must have published at least one volume of work in their life, either through a traditional publisher or via self-publishing. For example, the author Helen Potrebenko was included in the dataset, despite often being recognized as a British Columbian author, because she grew up in Alberta before moving to Vancouver, and her career included books on the history of Alberta. On the other hand, the author Frank Peretti was excluded from the dataset. Although he was born in Alberta, his family left the country shortly after his birth, and his works were geographically focused on the United States, where he grew up.

Maintaining consistency within the project requires setting a few additional boundaries regarding genre, language, and form around the material selected for bibliographic data collection. For the sake of this project, the genres for inclusion are novels, poetry, short stories, and drama (text only). Non-fiction works were excluded from the project for the sake of scope, as the majority of literary non-fiction works during the period were produced primarily through the local universities via scholarly monographs and theses. Thus, their inclusion would move the focus of this research from wider literary production and communities to scholarly academic production. While other forms of non-fiction work were considered, it was felt that it would require excessive subjective choice in deciding which works should be included, choices which could easily skew the data and results through personal bias. Literature written for children was also excluded. Thus, all non-fiction works were excluded from this project while all known

examples of novels, short stories, poetry, and dramatic texts were included, except those written for children.

The question of language must also be addressed. The texts used in this project were all published in either English or French. While the social landscape of Alberta encompasses a variety of cultures and languages, including texts in languages other than French or English would have required hiring translators not only for the front matter of texts, but also to interpret the archival materials used to locate both texts and the information used in the larger social networks. In light of these constraints, the scope of the texts was limited to English and French due to their nature as the official languages of Canada and as the languages most often used by publishers in the Albertan context.

Finally, only texts in monograph form were included. While serials are an important part of a writer's repertoire, to include periodicals would require increasing the size of the project exponentially. Therefore, to keep the size of the project within reasonable bounds, only texts published in individual volumes were included. Compilations were included if they were published as a volume and not a serial. However, it must also be noted that all serials mentioned in the front matter of a work were included as part of the bibliographic dataset.

Data Collection and Preparation for Analysis

Researching and building both bibliographic and social networks took numerous steps, from preparing a list of texts for inclusion in the bibliographic network to researching the data for the social network. While these steps will be outlined in detail below, a brief overview of the process may be referenced in Figure 4:

Figure 4

A Flowchart of the Data Collection and Preparation Process

Note. This flowchart provides a brief overview of the process of collecting the data for the networks and preparing it for analysis with Gephi.

The first step to collecting data for building a bibliographical network is compiling a list of all texts that fall within the project's research bounds. In other words, the first step was to compile a bibliography of all texts by Albertan authors published between 1975 and 1979. Assembling this bibliography began by identifying possible locations that would contain information about books published during the chosen time period. This was achieved using a few different approaches. First, the Alberta Business Registry was approached to attempt compiling a list of publishers active during the 1970s with the intention of subsequently using archival material to identify relevant texts released by these publishers. However, the Alberta Business Registry will only search for historical businesses if they are provided with the business name; they will not do an exploratory search for types of businesses or certain keywords such as "publisher" within a given time period.

The next step in identifying texts was using a pre-compiled bibliography. In 1982, Gloria Strathern published a bibliography of Alberta from 1954 to 1979. The majority of texts included for analysis were drawn from this bibliography. However, to avoid the inclusion of writers who did not fit the inclusion criteria for this project, each writer was briefly researched using resources such as *The Encyclopedia of Literature in Canada* (2002). Two works were removed due to the author being born in Alberta but moving away shortly after and not returning to the province in any meaningful way.

To avoid the possibility of relevant texts being missed and subsequently excluded from the pre-compiled bibliography and thus the dataset, further research into locating possible texts was conducted. This research was undertaken via newspapers.com, an online archival database of over 21 000 newspapers (Ancestry, 2022). To begin this search, search parameters were set to include only newspapers published in Alberta between January 1975 and December 1979.

Various keyword searches were made within these parameters such as “Alberta author*”, “Alberta writer*”, “Alberta publisher*”, “library AND author”, “library AND writer” and “Alberta Publishers Association”. These and other similar searches were made with the intention of finding articles highlighting the achievements of local writers or lists of newly published books by local authors or publishers, or even records of local literary events. The library searches were made in the hopes of finding local, especially self-published, writers who were involved with their libraries through advertised readings or writer-in-residence programs. In the end, however, these searches did not produce any relevant results beyond writers who were previously identified through Strathern’s bibliography.

Finally, keyword searches were also made using period-relevant terms such as “Aboriginal author*” and “Indian author*” in an attempt to locate any Indigenous writers who had been overlooked via other newspaper searches or in the bibliography. Specific searches of this nature were deemed necessary due to attitudes which might have excluded Indigenous writing from being described with the same terms as other writers at the time, which would in turn exclude them from search results. However, these searches did not return any writers who fit the predetermined inclusion criteria for the project.

The final list of books collected to create the dataset for bibliographic network analysis consisted of 123 texts. A list of these texts may be found in Appendix A. Twenty-five of these were published in 1975, 20 in 1976, 28 in 1977, 30 in 1978 and 20 in 1979. After compiling the list of texts, the next step in creating a bibliographic network was collecting all relevant information from the front matter of these texts to create a dataset for generating the network. For most bibliographic network studies, collecting this information means using data scraped from digital libraries and catalogues. However, using catalogued data means that “any analysis

of bibliographic data is beholden to the original author of the bibliographic record" (Vierthaler, & 李友仁, 2016, p. 97). While creating a library catalogue record requires following a strict set of guidelines in Canada, there is always some room for interpretation in how and what information to record. Furthermore, it is not standard to record all the information included in the front matter in a catalogue record, such as dedications and acknowledgements, information which is pertinent to this study. In addition, records standards change over time, and as many of the texts included in this research were created several years ago, it is possible, if not likely, that their library records were also created several decades ago and thus have not been updated to reflect current practices. For these reasons, the information for each text was manually collected from first editions of the works. Where possible, first editions of the text were specifically used for data collection in order to collect relevant inscriptions and original bibliographic data. First editions of the majority of the works could be found in regular circulation at the University of Alberta and other NEOS libraries, while a few select texts were held in special collections and archives. However, about thirty works could not be sourced in person. In these cases, the relevant bibliographical information was sourced from a combination of Strathern's bibliography and digital library metadata.

When compiling the dataset of the bibliographic data from the texts, not only was all traditional bibliographic information gathered, such as authors, editors, illustrators, publishers, and printers, but any information that could be considered relational or indicative of a social network was also recorded. As one of the purposes of this project is to see if front matter identify important aspects of a social network, all information from the front matter that might predict a social network must be taken into consideration. This is a departure from traditional bibliometric network studies, which usually examine only traditional standardized metadata, such as author,

publisher, date, and associated institutions. However, to later examine social relationships and structures, other information from the front matter such as inscriptions, dedications and acknowledgements were also gathered.

The next step was to begin organizing the gathered information into a structured dataset. This required compiling a comprehensive list of anyone or anything who would become an actor in the networks. As noted previously, actors in a social network may be either human or non-human so long as they play a role in a social structure or in facilitating social exchanges (Felski, 2016). As such, this list included all authors, publishers, illustrators, editors, etc., as well as anyone that a book was dedicated to, or anyone who was acknowledged by the author, as well as any organizations that any person included in the front matter was noted as having an association with. At completion, this list consisted of 950 separate actors. This list was subsequently used not only as part of the structured bibliographic dataset but also to identify possible actors in the social network. A list of ties between the actors was also compiled.

Having gathered the information required to generate the bibliographical networks, the research required to generate the comparative social network commenced. As previously noted, the social network was built only to correspond to a bibliographical network consisting of works from 1975, and for this reason the research for the social network was also bound to material created in 1975. To create the dataset to build the social network, each of the separate actors identified in the bibliographic dataset from 1975 were researched via archival records to identify primary sources that could attest to the existence of social ties or relations, with the exception of actors such as dates and cities. All fonds returned by the search that could include relevant information were subsequently researched.

These searches were made via Alberta on Record, an online database run by the Archives Society of Alberta, which includes records holding information for 63 separate archives across Alberta. The searches revealed four different collections with possibly relevant data: the University of Alberta Department of English fonds as well as the E.D. Blodgett fonds, the Robert Kroetsch fonds, and the James DeFelice fonds at the University of Calgary special collections. The Banff Centre Literary Arts fonds at the Banff Centre for Arts and Creativity were also identified, however, due to COVID-19 restrictions access was restricted and as such they were not researched for this study.

The dataset used to generate the social network was built out of information gathered from the material contained in these fonds. The information included in them came from various sources, including but not limited to correspondence, both personal and professional, personal journals, memos, pamphlets, and newspaper articles. Any information that could indicate a social link was recorded. For instance, if a record showed that three people worked together on a committee in a specific department, the people's names, the name of the committee and the department were all recorded. Similarly, if a piece of correspondence discussed a gathering that took place, not only were the names of the people who sent and received the correspondence recorded, but also the place where the gathering took place and the names of the people involved. After the information was gathered, a list of all the possible actors and their ties were compiled in the same way that the bibliographical data was organized.

Preparation for Analysis via Gephi

The final step before generating the networks for comparative analysis was to structure the information gathered in accordance with the requirements of Gephi, the software used to generate and statistically analyze the networks in this study. Gephi is a popular open-source software whose primary purpose is the visualization and exploratory analysis of networks and other graphs (Bastian & Jacomy, 2009; Gephi, n.d.). Originally released in 2009, Gephi remains a valuable tool for researchers who wish to explore network graphs both visually and via statistical analysis. Depending on their end goal, researchers may manipulate the visual appearance of the graphs in areas such as layout structure and colour in order to "make hypotheses, intuitively discover patterns, isolate structural singularities or faults during data sourcing" (Gephi, n.d.). It may also be used to analyse various metrics commonly used in social network analysis, such as diameter, degree weight, and various centrality measures (Gephi, n.d.). For this project, Gephi Version 0.9.2 was used, which was the most recent release when the project was started.

Uploading data into Gephi for the purpose of network visualization and analysis requires the data to be structured in a specific manner. Note that while there are multiple methods for data structuring depending on the upload method used, only the method used in this research will be described. First, all data must be organized in CSV tables. In one table, all nodes, or actors, in the network must be assigned a unique numerical identifier in addition to its normal textual identifier, or label. Other pertinent information that might be required to identify or describe the node may also be included. For this project, additional information used to describe the nodes included its type, such as whether a node represents an author, a publishing company, a place, a non-author person, or an educational institution. The year that the information was originally

generated was also included for graphs containing multiple years' worth of data. Similarly, when data from both the bibliographical and the social network datasets is combined to make a comparative network, the information identifying the source dataset, and whether the node appears in both datasets, is included. For reference, an example of a node table is included below, using bibliographical information gathered from *In Transit* by Eugene McNamara in 1975:

Table 1
Example of Data Organized into a Node Table for Network Analysis in Gephi

ID	Label	Reference	Year	Original Dataset
1	In Transit	Work	1975	Bibliographic
2	Eugene McNamara	Author	1975	Bibliographic
3	Pennyworth Press	Publisher	1975	Bibliographic
4	Calgary AB	Place of Publication	1975	Bibliographic

A second csv table outlining the relationships between nodes, or actors, in a network must also be uploaded. This second table outlines each occurrence of each relationship included in the data via the numerical identifier assigned to each actor in the node table. In other words, this table records the ties between nodes. For example, if there is a relationship between Node 1 and Node 2, the edges table defines that relationship for the dataset.

In a network, relationships between nodes, or edges, may be non-directed or directed. In simple terms, a non-directed edge represents a two-way relationship in the data. An example of this is two friends who go to dinner. Their relationship in a network graph would be represented as a non-directed edge, as the relationship can be defined from both directions. In contrast, a directed edge represents a one-way relationship. A common illustrative example is that of the hyperlink. A hyperlink has an origin and a destination, beginning on one webpage and ending on another. The relationship between the web pages is one way as the hyperlink only works in one

direction. In many network graphs, this is described as the *source* and the *target*, the source being where the relationship begins and the target describing where it ends. In the hyperlink example, the source would be the webpage the hyperlink begins on, and the target the page that the hyperlink takes you to when activated.

However, when it comes to defining real-life relationships, there is often significant ambiguity. For instance, one might say that the University of Alberta employed Rudy Wiebe, indicating a directed relationship, that of employer and employed. However, one might also say that Rudy Wiebe taught at the University of Alberta. If this statement is defined in the context of Wiebe's various employers, the direction of the relationship is reversed, from employee to employer. Thus, by changing the context and the question being asked about the data (Who did the University of Alberta employ? versus Who did Rudy Wiebe work for?), one changes the possible direction. Thus, as this project is intended to be exploratory, all edges are defined as undirected in order to avoid prematurely dictating the shape of the network and the questions one may ask. As a result, all edges of all data uploaded were defined as undirected.

Multiple kinds of relationships are represented as edges in the networks created for this project, as an attempt was made to record all possible points of contact between members of the network, as points of contact indicate a form of relationship. Furthermore, as indicated by actor-network theory, those relationships may exist not only between persons, but also between texts and organizations. Thus, in the bibliographic network, the relationships represented by the edges include those such as author–work, author–publisher, work–publisher, author–funding agency, and publisher–funding agency. Other relationships beyond basic bibliographic information that is found in front matter might also be included in a text, through front matter such as acknowledgements and dedications. These were also included in the datasets, and variously

encompass relationships such as author–colleague, author–friend, author– workplace, author–spouse, and author–parent, and author–sibling. This also led to the inclusion of directly implied relationships such as parent–parent, parent–sibling, and sibling–sibling (such as when the author listed family members who almost certainly have a relationship with each other beyond the author alone). Dramatic texts often included lists of the cast and crew members of the first run of a production, and as such the working relationships between those cast and crew members were also included in the dataset. In essence, any time the bibliographic front matter indicated the existence of a relationship between two objects in the network, those relationships were included in the dataset.

The relationships represented as edges in the social network were likewise gathered from recorded points of contact, although the kinds of relationships are more varied due to the wider nature of social relationships included in archival sources as compared to bibliographic data. Thus, the kinds of relationships represented in the social network include the relationships between spouses, parents, children, and friends. They also include relationships between a person and a place of employment, and of the relationships between colleagues. Relationships between people and organizations are included, as well as a few relationships between different organizations. Relationships of people and organizations to places are also included, where it was made clear that a person or organization was linked to a place through residence or a visit. In short, numerous kinds of relationships are represented by the edges in the social network, just as the experience of life in a society results in the existence of many kinds of relationships.

To structure the relational data into tables to upload for analysis, the numerical indicators of the nodes whose relationship is being defined are added to the table as either the source or the target. As the relationship is subsequently defined as undirected, it makes little difference as to

which node is described as source or target. Textual labels are then added as “From” and “To”, corresponding with the numerical source and target, respectively. Finally, as in the node table, additional information that might be necessary for visualization or analysis may also be added, such as the year that the information was generated in. For reference, an example edges table corresponding to the previous illustrated nodes table (Table 1 above) is included below:

Table 2
Example of Data Organized into an Edges Table for Network Analysis in Gephi

Source	Target	Type	From	To	Year	Dataset
1	2	Undirected	In Transit	Eugene McNamara	1975	Bibliographic
1	3	Undirected	In Transit	Pennyworth Press	1975	Bibliographic
2	3	Undirected	Eugene McNamara	Pennyworth Press	1975	Bibliographic
3	4	Undirected	Pennyworth Press	Calgary AB	1975	Bibliographic

This table outlines four relationships: that *In Transit* was written by Eugene McNamara, that *In Transit* was published by Pennyworth Press, that Eugene McNamara published through Pennyworth Press and that Pennyworth Press published out of Calgary, AB. In total, 443 pages of data were uploaded to Gephi in this manner. Appendix B contains samples of these datasets.

Network Analysis with Gephi

When a dataset is uploaded to Gephi, it automatically generates a network. However, that network is generally unreadable, resembling little more than a black and grey square. For visualization purposes, a layout algorithm is therefore applied to the network. All the network visualizations produced for this project utilize a force-generated layout, the Yifan Hu Proportional layout. Force-generated algorithms combine factors of attraction, repulsion, and gravity to position each node in relation to all the other nodes in the network based on the

strength of their connections (Cherven, 2015, pp.70-71; Hu, 2005). Therefore, in general, nodes will be positioned more closely to nodes that they have a strong connection with than those they do not, and nodes with ties to many other nodes will appear closer to the center of the graph than the periphery. For information on the mathematical specificities underlying the Yifan Hu and Yifan Hu Proportional algorithms, please refer to Hu (2005).

After a network has been generated with Gephi, a number of different statistics can be run on the network for analysis. This allows for a more comprehensive understanding of the network than basic visual analysis permits. The metrics applied to the bibliographic and social networks for comparative analysis include the diameter, the network density, connected components, modularity, degree and weighted degree, eccentricity, closeness centrality, eigenvector centrality, and betweenness centrality. While all of these metrics will be applied to the networks for the comparative analysis, the analysis will focus most heavily on the density, modularity, eccentricity, closeness centrality, eigenvector centrality, and betweenness centrality scores. Nevertheless, all of the metrics are necessary for understanding the networks holistically, and thus will be addressed at least briefly.

The first metric which may be used to analyse the networks is diameter. Diameter is a measure of network size, that is, of how many connections (as measured by nodes), separate the nodes on the two furthest peripherals of the network. In other words, how many connections must be made to travel across the network from one side to the other? (Khokhar, 2015, p. 123). On the other hand, density measures the internal connectedness of the network. The density of a network is a measure of the ratio between the actual number of edges connecting nodes and the total possible number of connections (Cherven, 2015, p. 183; Duke University Libraries, n.d.). The denser a network is, the closer its measure is to one. In other words, a network with a density

of one will have as many edges as it is possible for that network to have. Similarly, the connected components metric is also a measure of connectedness in a network or graph. However, instead of measuring the number of total edges compared to the possible edges in a network, the weakly connected components metric measures the level of connectedness between the disparate components that might be found in a network. In an undirected network, like those currently being studied, a weakly connected component is a section of the graph in which there is a path between each node (Cherven, 2015, p. 184; Tarjan, 1972). Finally, the modularity metric is used to understand the network as a whole in relation to the clusters, or communities, which form within it. A high modularity score describes a network with many different modules that have close internal connections but weak external connections to the rest of the network. Measuring modularity is a "fundamental" method of identifying communities within social networks. (Blondel et al., 2008; Khokhar, 2015, p. 132).

The degree and weighted degree measures are used to measure the nodes within a network. In the context of the network, degree simply refers to the number of edges that are connected to a node. In other words, if a node is connected to five other nodes via five separate edges, it has a degree of five. A weighted degree, in contrast, measures the weight of the edges connected to the node, as opposed to the number of connections. Thus, if a node has five edges, but four of these edges have a weight of one while the fifth has a weight of two, the measure of the weighted degree will be six. Measures of degree may be applied to individual nodes, or they may be averaged across the entire network.

However, while it is possible that a node with a high number of connections possesses a large amount of influence, it is not a given. Eccentricity and centrality measures, which measure connectivity and influence levels much more comprehensively, are a more accurate means of

comparing the importance of nodes within a network. (Cherven, 2015, pp. 187, 193; Matas et al., 2017, p. 204). Eccentricity is thus another notable metric used to study the nodes in a network. A node's eccentricity score simply measures how many steps must be taken to cross the network. Thus, an eccentricity score indicating that a node is positioned in the center of the graph will be half the size of the network's diameter. When combined with other metrics, such as centrality measures, eccentricity can provide contextual information to help determine the influence of nodes within a network (Cherven, 2015, p. 183).

Finally, the closeness centrality, eigenvector centrality and betweenness centrality are all measures that examine a node's position in a network relative to the center of a network. Closeness centrality is a measure of the average distance between all of the nodes in a network to one specific node (Matas et al., 2017). By comparing the closeness centrality of different nodes, one may determine which nodes are the closest to the other nodes in the network, and thus are positioned in the center of the graph. The second centrality measure, eigenvector centrality, measures the extent to which a node is connected to influential nodes in a network. Measuring a node for eigenvector centrality means not simply measuring the connections that it has to other nodes in general, but specifically to nodes who have high levels of influence in the network. A node with a high eigenvector centrality is well-connected to influential nodes, and thus is considered influential itself (Cherven, 2015, p. 187; Khokar, 2015, p. 141; Matas et al., 2017, p. 206). Finally, betweenness centrality is also a measure of a nodes' importance in a network. It measures how often the shortest path between two nodes passes through a specific node. Often, although not always, a node with a high betweenness centrality will act as a bridge between clusters in a network that would have otherwise remained disconnected. Thus, a node with a high betweenness centrality may be considered influential in a network in regard to its ability to

facilitate communication between disparate sections of a network. (Cherven, 2015, p. 188; Matas et al., 2017, p. 206).

Both the visual networks and these metrics will be used to answer the question of whether the bibliographic network can identify key characteristics of the social network. To do so, the networks will be analysed in a few different ways. First, the networks will be examined in regard to their size and shape. In other words, how do the networks compare in terms of their overall size, the density of the connections within the networks, and the way in which the parts of the network cluster into communities? Secondly, how do the contents of the networks compare with each other? To what extent can members of the bibliographic network be found in the social network, and vice versa? Do the nodes which are common to both networks have the same relative position in the networks in regard to either physical location or level of influence? And do these nodes share the same relationships in both networks? To answer these questions, metrics such as degree weight and the centrality measures will be compared between the nodes common to both the bibliographic and social networks to determine whether the nodes play similar roles in both networks. Finally, the results of these explorations will also be applied more generally to the question of what the networks can reveal about the history of Albertan literature in the 1970s. Thus, the comparative analysis between both the bibliographic and social networks will be used to answer the questions relevant to this thesis.

Chapter 4: Results

The methods described in the preceding chapter resulted in the generation of multiple networks, which are presented in the following pages. They consist of a bibliographic network of texts created in 1975 (Figure 5), a literary social network of Albertan writers in 1975 (Figure 7), and a network combining the 1975 bibliographical and social networks (Figure 8). These networks will be presented with a brief overview of their various metric scores, and then, through visual and metric comparative analysis, these networks will be used to explore the questions of whether a bibliographic network generated from the front matter of texts can identify cardinal aspects of a corresponding social network, and whether these networks can tell us anything about Albertan literary communities.

Network of Bibliographic Data, 1975

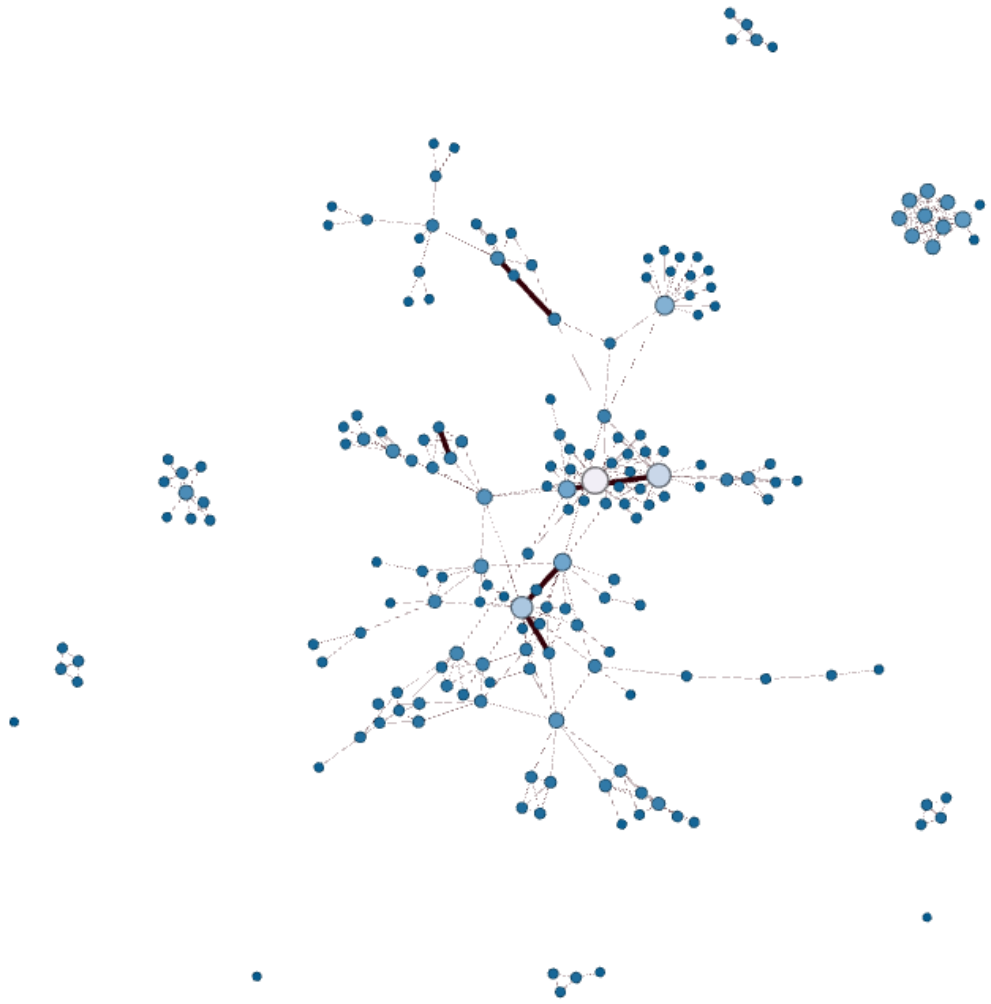
This first network was generated from bibliographic data collected from books published by Albertan authors in 1975 and may be viewed in Figure 5. This network will be compared with a corresponding social network to explore the extent to which a bibliographic network can identify major characteristics of a corresponding social network. All data from this network is also part of the network of bibliographic data, 1975-1979 (Figure 14).

Results, Network of Bibliographic Data, 1975

The bibliographical network of texts created by Albertan authors in 1975 (Figure 5) has 182 nodes and 313 edges. The diameter of the network is 12.0, with an average path length of 4.945. The graph density is 0.019. The network has 10 weakly connected components. When assigned a resolution of 1, the graph modularity is 0.814, and divides into 19 communities,

Figure 5

A Network of Bibliographic Data, 1975



Note. The nodes in this figure are weighted by degree: the nodes with the most connections are large and pale, while the nodes with less connections are small and dark. Generated with Gephi.

ranging from approximately 3 to 34 members in each. The average clustering coefficient score is 0.671. The average degree (number of edges per node) is 3.44, while the average weighted degree is 3.495. No nodes had an eccentricity score of 6.0 (the score that would indicate placement in the center of a graph with a diameter of 12.0). However, thirteen nodes share an eccentricity score of 7.0: Toronto ON, New Press, Oolichan Books, Playwright's Co-op, *Badlands. A novel*, *Chief Shaking Spear Rides Again*, *Fools and Masters, Pause, Ready, Steady, Go. A play, Take Me Where the Water's Warm, The Photographic Moment, The Rainmaker,* and *The Stone Hammer Poems.* Eight nodes have a closeness centrality of 1.0: *Roundhouse,* Coach House Press, Simon & Schuster, *Beyond the Tangled Mountain, Janey Canuck in the West, Poetic Reflections, take away the names* and *The Rich Man*. The five nodes with the largest eigenvector centrality are *The Stone Hammer Poems,* Robert Kroetsch, *Roundhouse*, Douglas Riske, and Jack Ackroyd. Finally, the ten nodes with the largest betweenness centrality are New Press, Toronto ON, Playwright's Co-op, the Canada Council for the Arts, Robert Kroetsch, *The Stone Hammer Poems,* Red Deer College Press, Edmonton AB, and John Phillip Kitsco.

While a fuller breakdown of these results will follow the introduction of the other networks, between the visualization and the metric results, there are a few aspects of the network that bear noting. Firstly, in the visualization, one sees that while the majority of the graph is connected, there are nine communities who are isolated from the larger network. In this network, these represent texts whose bibliographic data does not have any overlap with other works. One also observes that the nodes Toronto ON, New Press, and Playwright's Co-op both have eccentricity scores that place them in the center of the network as well as some of the largest betweenness centralities, indicating that these three nodes are some of the most well-connected in the network. As a result, one sees that the data suggests that New Press and Playwright's Co-

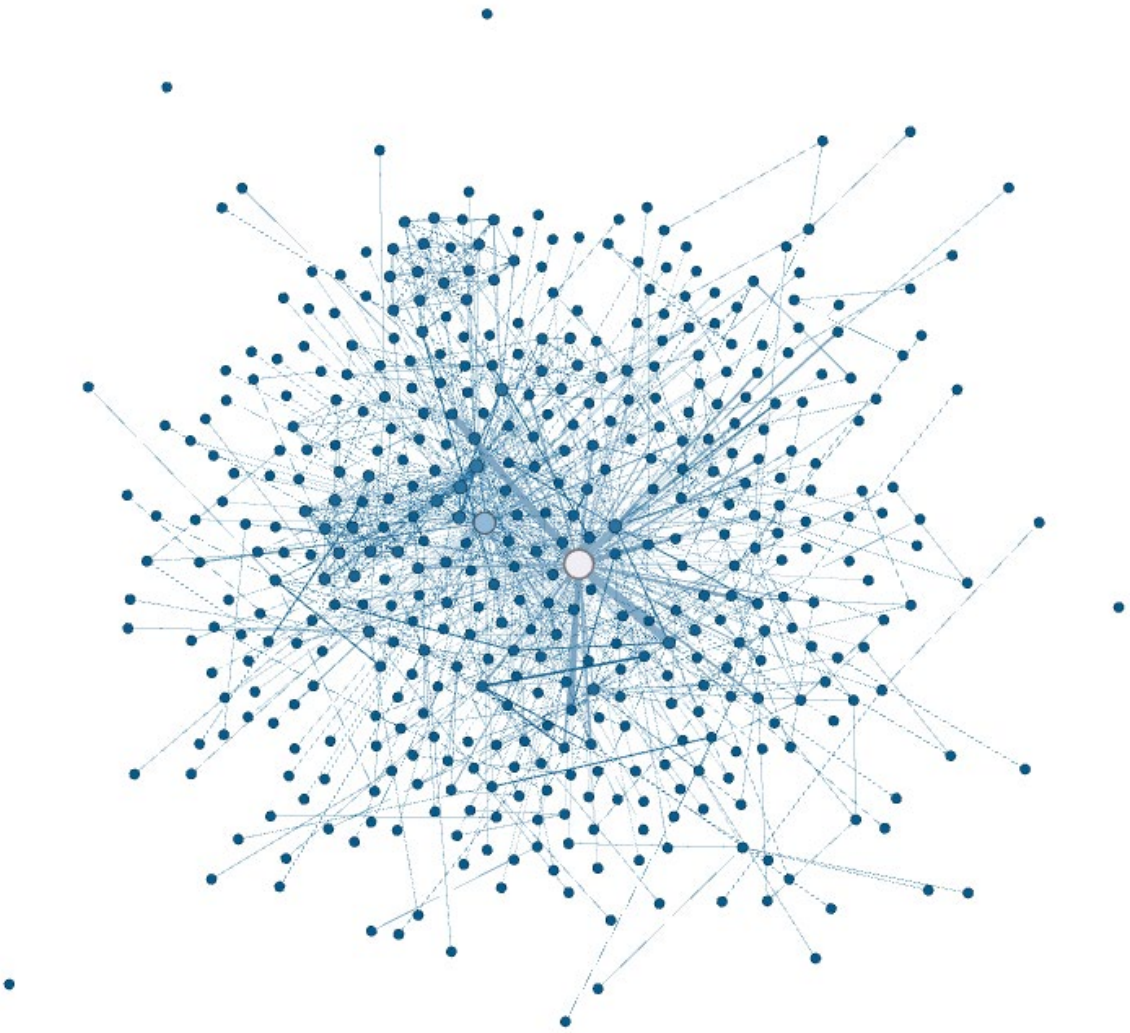
op, both based in Toronto ON, are likely some of the most common organizations publishing Albertan texts in the 1970s.

Literary Social Network, 1975

The literary social network (Figure 7) was generated from information gathered from primary sources created in the year 1975. As noted previously, this material came from the James DeFelice fonds, the Robert Kroetsch fonds, and the E.D. Blodgett fonds at the University of Alberta special collections, as well as the Department of English fonds at the University of Alberta Archives. Before reporting the results for this network, however, it must be noted that this network has been manipulated through the deliberate exclusion of one piece of data. A large amount of the information used to create the datasets for this network was taken from the Robert Kroetsch fonds. These fonds provided valuable information about many connections in the Albertan literary community, as Kroetsch often wrote about other people in his notes and correspondence. However, because so much of this information originated with Kroetsch, the dataset is artificially skewed significantly towards Kroetsch, with a disproportionate number of edges originating in him. Therefore, the node representing Kroetsch has been excluded from this network in order to generate a more distributed network so that the network contents outside of Kroetsch may be made more visible. In other words, manipulating the data this way enables one to see relationships and communities that are otherwise hidden when Kroetsch is prioritized in the network. However, it must also be acknowledged that both the network generated with the fonds as well as prior scholarship show that Kroetsch played a notable role in the history of Albertan literature. Therefore, while the network that excludes Kroetsch will be used for the major comparative analysis, the network visualization which includes Kroetsch (Figure 6) has

Figure 6

A Literary Social Network of Alberta, 1975, Robert Kroetsch Included



Note: The nodes in this figure are weighted by degree: the nodes with the most connections are large and light blue, while the nodes with less connections are smaller and dark blue. When compared with the literary social network of Alberta, 1975, which does not include Robert Kroetsch as a node (Figure 7), one sees the extent to which Kroetsch's presence in the network acts as a major gravitational hub, drawing all other nodes to him and disguising the existence of other communities and linkages. Generated with Gephi.

Figure 7

A Literary Social Network of Alberta, 1975

Note. The nodes in this figure are weighted by degree: the nodes with the most connections are large and light blue, while the nodes with less connections are smaller and dark blue. When compared with the literary social network of Alberta, 1975, which includes Robert Kroetsch (Figure 6), one sees that this network makes clustered communities, relationships between nodes, and the overall positioning of nodes within the network notably more visible for visual analysis. Generated with Gephi.

been generated and included for reference and basic commentary. The full exposition of the metrics for this network may be found in Appendix D.

Results, Literary Social Network, 1975

The literary social network of Alberta in 1975 (Figure 7) contains 452 nodes and 742 edges. The diameter of the network is 14.0, with an average path length of 5.348. The graph density is 0.007. The network has 36 weakly connected components. When assigned a resolution of 1.0, the graph modularity is 0.824 and divides into 47 communities ranging from approximately 2 to 89 members in each. The average clustering coefficient is 0.479. The average degree score is 3.283 while the average weighted degree is 3.412. One node has an eccentricity score of 7.0: Max Braithwaite, while five other nodes have an eccentricity score between 6.0 and 8.0: anonymous1, anonymous2, James DeFelice, Fil Fraser, Canada Day ’75, anonymous3, the Ontario Institute for Studies in Education, anonymous4, and the Canadian Writers and Poets on Tape series. Twenty nodes had a closeness centrality of 1.0: the Canada Studies Foundation, NEW, anonymous5, anonymous6, anonymous7, anonymous8, anonymous9, anonymous10, anonymous11, anonymous12, anonymous13, anonymous14, Lantzville ON, Orangeville ON, Surrey BC, the Malahat Review, Selkirk College, and the Universities of Calgary, Prince Edward Island and Western Ontario. The ten nodes with the largest eigenvector centrality scores are anonymous15, Douglas Barbour, anonymous16, Canada Day ’75, Stephen Scobie, interdepartmental correspondence in the English department at the University of Alberta, anonymous17, anonymous 18, anonymous19, and anonymous20. Finally, the ten nodes with the largest betweenness centralities are Canada Day ’75, anonymous21, Rudy Wiebe, department meetings in the English department at the University of Alberta, anonymous22, anonymous23, anonymous24, Graeme Gibson, Douglas Barbour, and William Spamos.

There are a number of notable aspects to this network. Firstly, one sees that this social network is larger than the corresponding bibliographic network of 1975 (Figure 5). The overall network graph is larger with a diameter of 14.0 instead of 12.0. This social network also has a smaller density than the bibliographic network, with a score of 0.007 as opposed to 0.019. However, the modularity between the graphs is similar, with this network having a score of 0.824, while the bibliographic network has a score of 0.814. This indicates a commonality between the structure of the networks, namely, that the constituent members of the networks cluster into communities at roughly the same rate relative to the size of the networks. In regard to the specific content of the network, one observes that the node representing the event Canada Day '75 has both one of the largest eigenvector centrality scores and betweenness centrality scores, as well as one of the most central eccentricity scores, indicating that this event is central to the social network, linking both writers and non-writers. One also sees that Douglas Barbour, while not holding a central eccentricity score, has some of the highest eigenvector centrality and betweenness centrality scores, suggesting that Barbour is one of the most influential nodes in the social network. This aligns with established research in Albertan literary history, which recognizes Barbour both as a busy Albertan writer and an active member of the English faculty at the University of Alberta. Similarly, one also sees that the writers such as Barbour, Bert Almon and Rudy Wiebe are linked through their work at the University of Alberta, while the Banff School of Fine Arts and the Saskatchewan Summer School of the Arts at Fort San SK also facilitated linkages between writers.

Bibliographic and Social Network Comparison

With the networks having been generated and basic metric analyses run on them, the networks are ready for comparative analysis. This analysis is critical to answering the question of whether

or not a bibliographic network can identify notable characteristics of a literary social network. Examining both the overarching structures and individual elements of the bibliographic and social networks of 1975 (Figures 5,7) in relation to each other will provide the evidence needed to address the question. Following the comparison of the networks to examine their identifiable qualities, the networks will be further explored and discussed for additional information that they may reveal about Alberta's literary history in the 1970s. Later, both the implications and limitations of the project will be discussed along with suggestions for possible further research.

The comparison between the bibliographic and social networks begins with a structural overview of the networks. The first consideration is size. As previously stated, the 1975 bibliographical network (Figure 5) is comprised of 182 nodes and 313 edges, while the 1975 social network (Figure 7) has 452 nodes and 742 edges. In other words, the social network has 148% more nodes than the bibliographical network, and 137% more edges than the bibliographical network. Thus, in regard to raw size, the social network is larger than the bibliographical network. This size difference is fully expected as bibliographic data tends to be standardized, limited by publishing norms and the amount of space available in a printed book, while a social network, by way of representing lived experience, does not have these constraints and thus may expand itself exponentially.

However, more notable differences in the networks' structures are revealed through an examination of their densities. The density, as noted previously, measures the ratio of possible connected edges in a network to the actual number of connected edges (Cherven, 2015, p. 183). Thus, a network with a higher density has a greater overall level of internal connection relative to the size of the network. In this case, the bibliographical network has a density of 0.019 while the social network has a density of 0.007. In other words, the bibliographical network is denser than

the social network, meaning that the bibliographical network has a larger proportion of realized possible internal connections than does the social network. This difference in graph density may lead one to hypothesize that the overall structure of the bibliographical network is less fragmented than the social network; that is, that it has less isolated components and communities than does the social network. Examining whether this hypothesis is true requires examining the connected components, modularity, and path length metrics.

When examining the connected components metric, it is necessary to note that because both networks are undirected, the metric measures for only weakly connected components as opposed to strongly connected components. The bibliographic network has 10 weakly connected components, while the social network has 36. However, the different sizes of the networks must be considered. When expressed as a ratio of number of nodes to weakly connected components, one sees that the bibliographic network has more nodes per weakly connected component, 18.2, than does the social network with 12.555 nodes per weakly connected component, a 36.7% difference. Thus, while the social network has more connected components than the bibliographic network, the bibliographic network has more weakly connected components than the social network, relative to the size of the network.

The next metric to examine is modularity. As noted previously, a network with high modularity is a network containing communities that have close internal links but weak links with the rest of the network. When the modularity metric is calculated with a resolution of 1.0, the bibliographic network divides into 19 communities, while the social network divides into 47 communities. Within a network graph, communities are, at their most basic definition, clusters of nodes. However, a closer examination of the network graphs reveals semantic coherence to the communities. For example, within the bibliographic network, one observes one community

which forms around the Book Publishers Association of Alberta, while in the social network, a community is formed by the nodes directly associated with the English department at the University of Alberta. When adjusted for the size of the networks, we see that ratio of nodes relative to the number of modules is almost the same in both networks: the ratio for the bibliographic network is simplified to 9.58, while the ratio for the social network is simplified to 9.62, a difference of only 0.42%. While this ratio does not account for nodes which belong to multiple modules, such as bridge nodes which connect two otherwise disparate communities, it does provide a general level of insight into the networks' structural divisions, especially when the modularity scores themselves are compared. The bibliographic network has a modularity score of 0.814 while the social network has a modularity score of 0.824, a difference of only 1.2%. Thus, it is clear that both the bibliographic network and the social network divide into communities of almost the same size and strength relative to the size of the networks.

One must also compare the average path lengths between the networks. The bibliographical network has an average path length of 4.945, while the social network has an average path length of 5.348. When the path length of the bibliographical network is equalized in relation to the size of the social network, it measures 5.769. Thus, the difference in path length between the networks is 7.57%, with the bibliographic network having the longer average path length, or edge distance between nodes.

One sees, therefore, that the bibliographic and social networks have both structural similarities and differences in regard to diameter, density, weakly connected components, modularity, and path length. To continue the analysis, one must move from an examination of the overall structure of the network to an examination of the content of the networks. To answer the question of whether a bibliographic network can identify the characteristics of a social

network, one must ask the more specific question of whether a bibliographical network can identify actors who are influential in the social network?

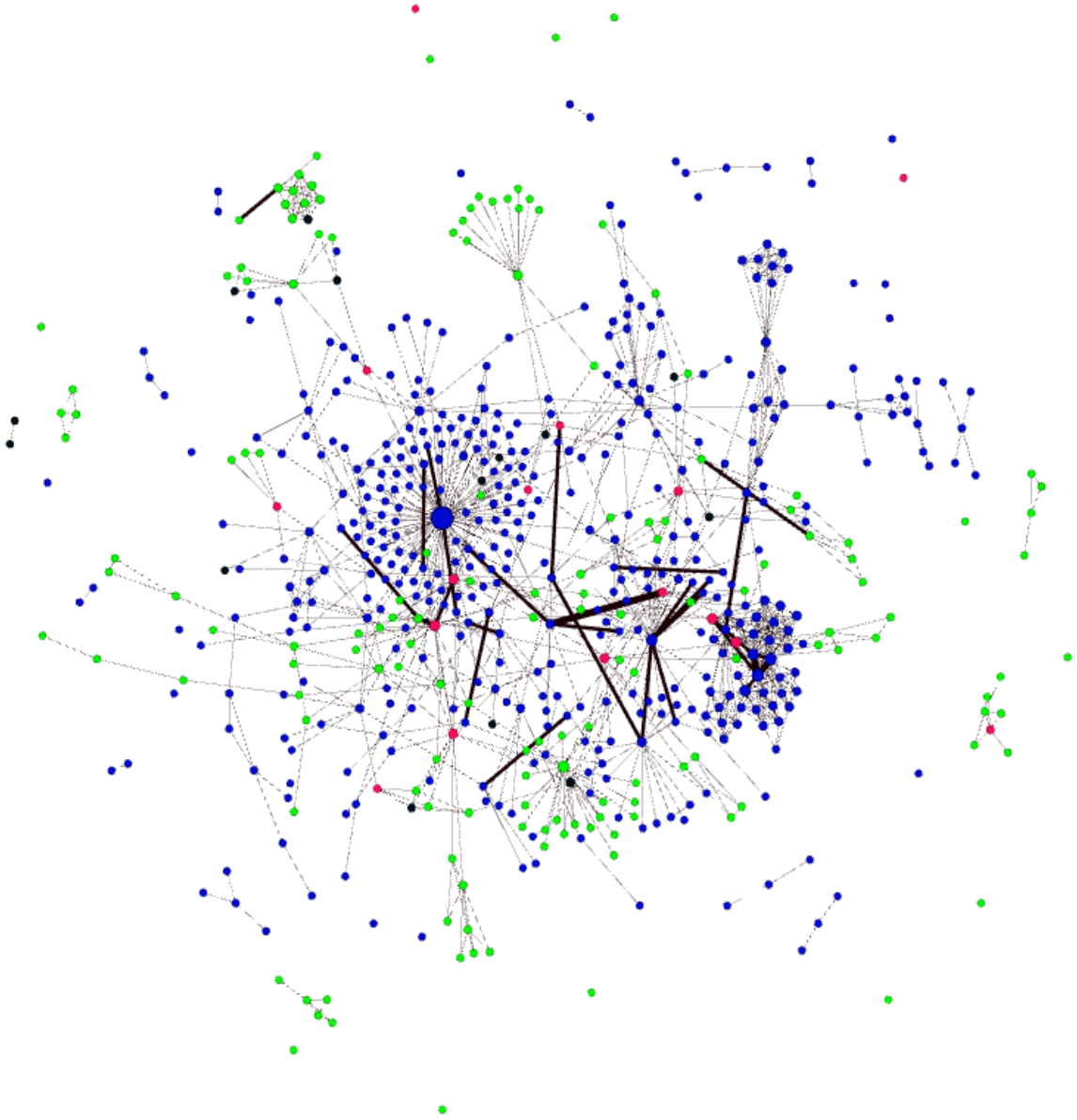
Comparing the networks on a nodal level begins by noting which and how many actors are common between the networks. In order to discover which nodes are common to both the bibliographic and the social networks, a network combining the data from both the network of bibliographic data (Figure 5) and the literary social network of Alberta, 1975 (Figure 7), was generated. This network identifies nodes common to both networks in red, while nodes which are unique to the bibliographic and social networks are green and blue, respectively.

By filtering out the nodes which are unique to either the bibliographic or social networks from Figure 8, one easily discovers the identity of the nodes common to both networks, as viewed in Figure 9.

As one sees in Figure 9, the nodes common to both networks span people, places and organizations. The people in common are Rudy Wiebe, Stephen Scobie, Wilfred Watson, Clara Thomas and Peter Thomas. The places in common are Edmonton AB, Calgary AB, Vancouver BC, Nanaimo BC, and Toronto ON. The organizations in common include the publishers the Playwright's Co-op, Coach House Press, Applegarth Follies, and New Press, as well as the Canada Council for the Arts. But how do these nodes compare to each other in regard to how they are situated in the separate networks in regard to connectivity and influence? To answer these questions, one must compare the nodes' individual metrics between the two networks. While these metric results will be visualized in the following discussion, for reference, charts conglomerating all the metric values described below may also be found in Appendix C.

Figure 8

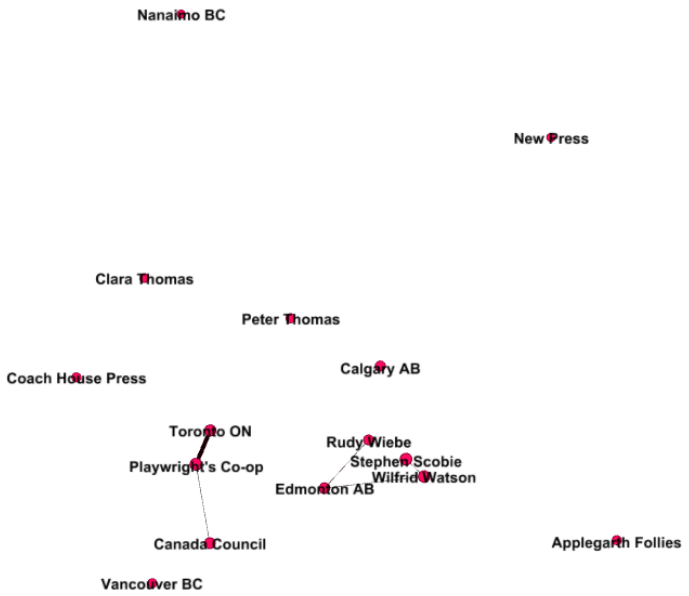
Bibliographical and Literary Social Networks in Alberta, 1975



Note. This network has been weighted by degree, so nodes with the most connections appear the largest. It has also been partitioned by the network of origin. Blue nodes represent data from the social network, green nodes are from the bibliographic network, and red nodes represent actors who appear in both networks. Metrics for this network are included in Appendix C. Generated with Gephi.

Figure 9

Actors Common to the Bibliographic and Social Networks, 1975



Note. This figure is a filtered version of the combined bibliographical and literary social networks in Alberta, 1975, displaying only the nodes that are common to both networks. Generated with Gephi.

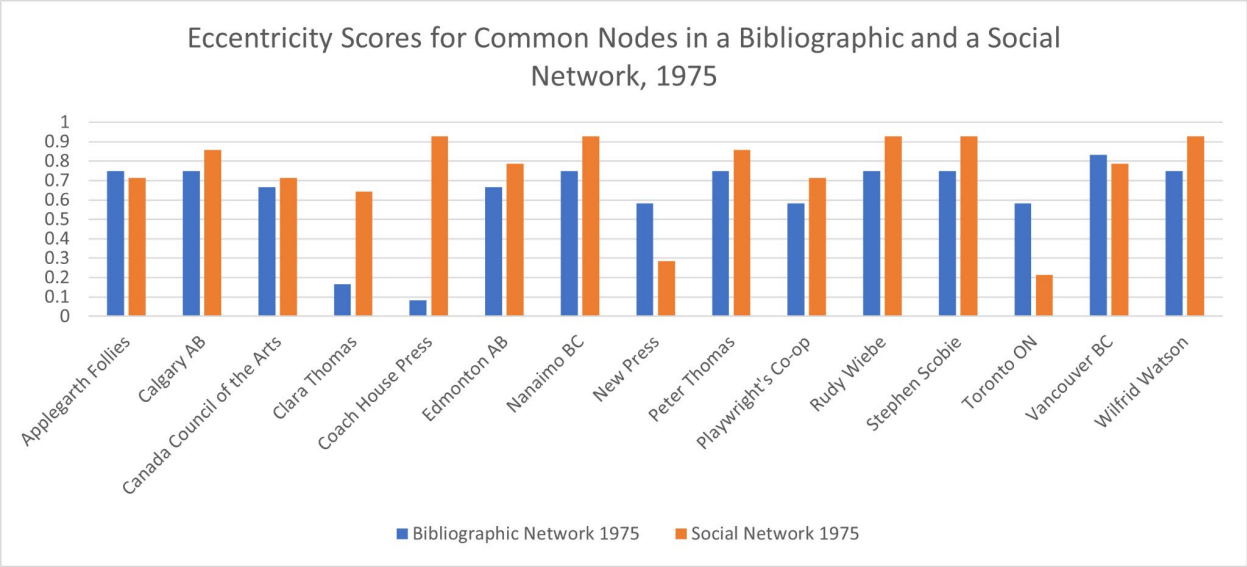
The first step in comparing the nodes between networks is to make a brief examination of the degree and weighted degree measures. An examination of the top ten percent of nodes by both degree and weighted degree in the networks reveals no overlap between the networks. In other words, the nodes with highest levels of raw connectivity are different in the two networks. However, as noted previously, the degree measures simply indicate the number of connections that a node has within a network, not the level of influence that a degree might possess. Thus, it is necessary to move beyond a simple analysis of degree measures to the more comprehensive eccentricity and other centrality measures in order to more deeply understand the similarities and differences between the networks.

The eccentricity of a node is a centrality metric which measures the number of "steps," or number of other nodes that must be passed through, for a node to reach the opposite side of the network graph. For example, if the diameter of the network is 10.0 and the eccentricity of a node is 9.0, it indicates that the node is placed near the edge of the network graph, as it must make 9 steps to cross a network with a total possible 10 steps. On the other hand, if the eccentricity of the node is 5.0, it indicates that the node is in the centre of the graph as it must only pass through half of the possible nodes to reach the edge of the graph.

In order to account for the different sizes of the networks being compared, the eccentricity scores of the nodes were expressed as a ratio in decimal form. For example, a node with an eccentricity measure of 8.0 from the bibliographic network, which has a diameter of 12, would be expressed as the ratio 8:12, or 0.75. Having expressed the eccentricity of the various nodes as ratios, they were compared across the networks.

Figure 10

Eccentricity Scores for Common Nodes in the Bibliographic and Social Networks, 1975



Note. This figure displays the eccentricity scores of the various nodes in both the bibliographic network, 1975 and its corresponding social network. The scores used to generate the chart are included in Appendix C.

The comparison of the nodes between the networks in regard to eccentricity revealed next to no similarity in how the nodes were positioned between the networks. When adjusted for the size of the network, none of the nodes shared the same eccentricity, meaning that the nodes are positioned differently relative to the network as a whole in the different networks. In other words, the different actors are situated differently in the bibliographic network than they are in the literary social network. The nodes with the smallest changes in network position were the writer Rudy Wiebe and the publisher Applegarth Follies. Both of these nodes' eccentricity measures change by only 5% between the networks, although the node representing Rudy Wiebe moved closer to the center of the social network from the bibliographic network, while the node representing Applegarth Follies moved closer to the edge of the social network from the bibliographic network. The largest change in eccentricity score was Coach House Press, whose score changed by 1020% between nodes. However, when one looks at the eccentricity scores themselves, 1.0 in the bibliographical network (diameter 12.0) and 13.0 in the social network (diameter 14.0), one sees that the node is on the periphery of both networks. Thus, a large change in eccentricity score does not necessarily indicate a move from the periphery to the center of the network.

Figure 11

A Visual Comparison of the Eccentricity of Coach House Press in the Bibliographic and Social Networks

Note. This figure displays the node Coach House Press (red) in the network of bibliographic data, 1975 (Figure 5) (left) and in the literary social network, 1975 (Figure 7) (right). In the bibliographic network, the node is on the left periphery of the network, belonging to a module distinct from the main network graph. In the social network, the node is on the right periphery. Despite appearing somewhat more centralized, note how the edges terminate at this node, placing it on the edge of the graph in terms of the ability to traverse the network via edges. Thus, one sees that despite having different eccentricity scores (1.0 versus 13.0), the node remains on the edges of the network.

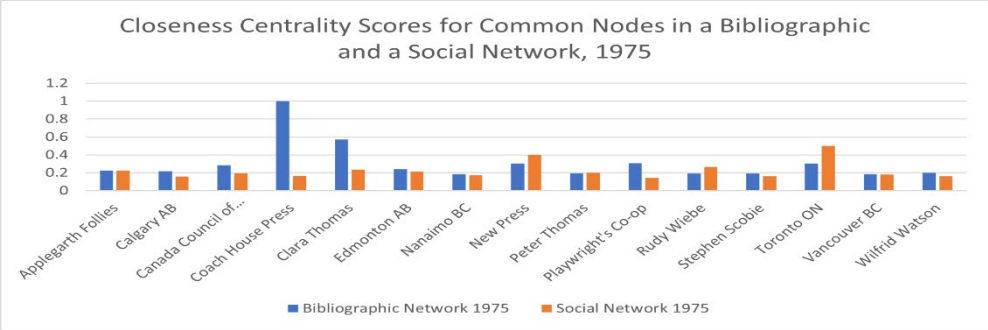
In the end, an examination of both the eccentricity scores themselves and the percentage change between the nodes in the separate networks reveals that two thirds of the time, nodes are closer to the center of the bibliographic network than they are the social network. A node representing either a person or an organization is likely to be positioned closer to the center of the bibliographical network by 50%, while a node representing a place is four times as likely to be positioned closer to the center of the bibliographic network. Thus, on early examination, it appears that the bibliographic network has little ability to identify notable features of the social

network in regard to eccentricity. However, before discussing the implications of these results in depth, the results of the comparison between the nodes' centrality measures will be introduced.

The first centrality measure used to compare the nodes in the two networks is the closeness centrality. Closeness centrality is a measure of the average distance between a node and all the other nodes in the network (Matas et al., 2017, p. 206). In other words, closeness centrality is used to measure how close a node is to all the other nodes in the network on average. Unlike the eccentricity measure, the closeness centrality measure is normalized by Gephi, so the measures can be compared between networks of different sizes without any manipulation.

Figure 12

Closeness Centrality Scores for Common Nodes in the Bibliographic and Social Networks, 1975



Note. This figure displays the closeness centrality scores of the various nodes in both the bibliographic network, 1975 and its corresponding social network. The scores used to generate the chart are included in Appendix C.

When comparing the closeness centrality of common nodes in both the 1975 bibliographic network and the 1975 literary social network, one sees that the closeness centrality of the nodes in the bibliographic network does little to predict the closeness centrality of the nodes in the literary social network. The centrality measure of only three nodes changed less than 5% between the two networks. Peter Thomas had a centrality measure of 0.195833 in the bibliographic network and a centrality measure of 0.198834 in the social network, for a change of 2%. The location Vancouver, BC likewise had a change in centrality measure of 2%, from

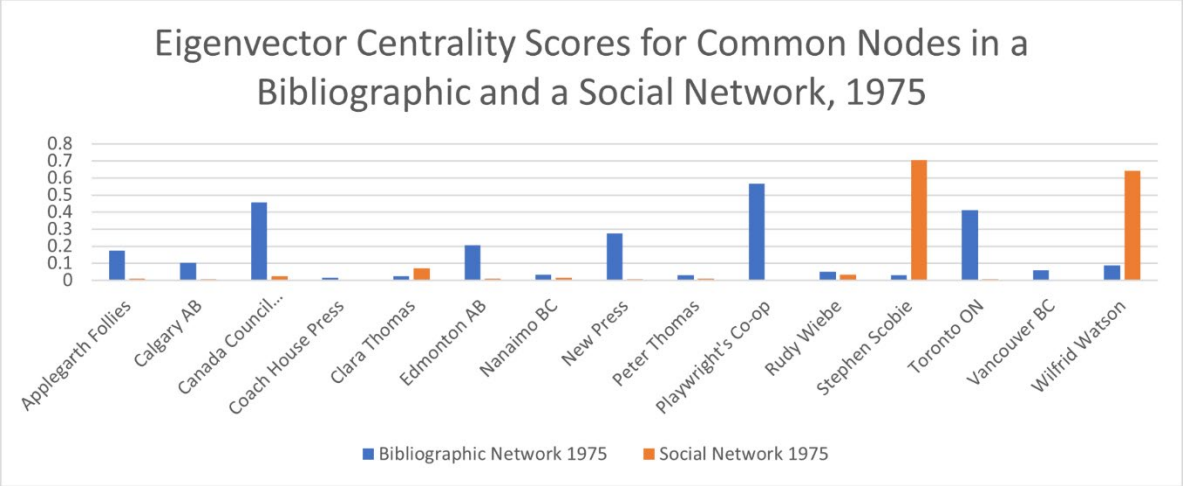
0.183594 in the bibliographic network to 0.180462 in the social network. Finally, the publisher Applegarth Follies had a change of 0.7% between networks, with a closeness centrality measure of 0.223810 in the bibliographic network and of 0.225361 in the social network.

However, the centrality measures of many of the other nodes changed markedly between networks. The closeness centrality of Coach House Press changed from 1.0 in the bibliographic network to 0.166445 in the social network, a change of 83%, while the Canada Council changed from 0.284274 in the bibliographical network to 0.196027 in the social network, a change of 31%. Rudy Wiebe's closeness centrality measure changed by 39%, while Stephen Scobie's changed by 16% and Clara Thomas' changed by 58%. Likewise, the measure for Toronto ON changed by 64%, while Playwright's Co-op changed by 53%. Thus, the closeness centrality in the bibliographical network does not predict the closeness centrality in the literary social network. While a few centrality measures were similar, the majority of centrality measures changed by several percent between the networks. These changes were not limited to one type of node, but occurred across people, places, and organizations.

The next centrality measure used to compare the networks is the eigenvector centrality measure. Eigenvector centrality is a measure of influence in the network. Like the closeness centrality score, it measures how central a node is to a network. However, while the closeness centrality score simply measures how close a node is to the other nodes in a network, the eigenvector centrality score specifically measures how closely connected a node is to the most central nodes in a network. Thus, eigenvector centrality measures influence in a network by measuring how connected nodes are to nodes of influence in that network.

Figure 13

Eigenvector Centrality Scores for Common Nodes in the Bibliographic and Social Networks, 1975



Note. This figure displays the eigenvector scores of the various nodes in both the bibliographic network, 1975 and its corresponding social network. The scores used to generate the chart are included in Appendix C.

There are noteworthy changes between the eigenvector centrality scores of the nodes common to both the 1975 bibliographic network and the 1975 social network. Firstly, one observes that the eigenvector scores of 80% of the nodes decrease in size from the bibliographic network to the social network, indicating that the influence of these nodes is less in the social network than it is in the bibliographic network. The only nodes whose influence increased in the social network were Stephen Scobie, Wilfred Watson, and Clara Thomas, whose eigenvector centrality scores increased by 2320%, 630%, and 185%, respectively. Of the nodes whose eigenvector centrality scores decreased, the smallest change in eigenvector centrality was 35%, with Rudy Wiebe's eigenvector centrality changing from 0.050209 in the bibliographic network to 0.032460 in the social network. However, of the nodes whose eigenvector centrality score decreased, 66.7% of the changes in score fell in the range of a 91-100% change. Thus, in regard

to the ability of the bibliographic network to predict the social network, one sees that, according to the data available, it is likely that a node in the social network will have a lower eigenvector centrality score than in the bibliographical network, and that the change in score is likely, by a ratio of 2:1, to be between 91% and 100%. Therefore, the bibliographical network has a small ability to identify a nodes' change in influence, as measured by eigenvector centrality, in the literary social network.

The final centrality measure to compare is the betweenness centrality. Unlike eigenvector centrality, betweenness centrality is not a measure of influence, but rather a measure of linkage and communication. Betweenness centrality measures the number of times that a node is part of the shortest path between two other nodes. When the node transects the shortest path between nodes, it acts as a bridge through which information or resources can easily travel between different parts of the network. (Matas et al., 2017, p. 206). Thus, even if a node is low in other centrality measures such as eigenvector centrality, a node with a high measure of betweenness centrality may still be crucial to the network as it facilitates communication throughout the network.

The examination of the betweenness centrality of nodes common to both the bibliographic and literary social networks reveal that the score changes for all the nodes but one between the networks. One node, Clara Thomas, retained a betweenness centrality score of 0.0 in both the bibliographic network and the literary social network. However, the betweenness centrality scores of all the other nodes representing humans increased, with the exception of one, Wilfred Watson. Watson's betweenness centrality score fell from 0.025046 in the bibliographic network to 0.0 in the social network. On the other hand, Rudy Wiebe's betweenness centrality increased by 2249%, from 0.008471 in the bibliographic network to 0.198992 in the social

network. Similarly, Stephen Scobie's betweenness centrality increased from 0.0 to 0.004541 between the networks, while Peter Thomas' score increased from 0.0 to 0.011027. Therefore, in regard to the human-representative nodes in the networks, 60% of their scores increased, 20% stayed the same, and 20% decreased.

The betweenness centrality scores of all of the other nodes in the networks decreased, with the exception of Nanaimo BC, whose score increased from 0.0 to 0.007352 in the social network. The decreased scores between networks ranged from a change of 70.8% to 100%. Of these scores, the change in score for 67% of the nodes was between 99% and 100%, with half of those scores falling to a betweenness centrality score of 0.0. Therefore, one sees that in regard to betweenness centrality, nodes representing non-humans are likely to decrease between networks, and that decrease is likewise likely to be notable, falling to or next to 0.0. On the other hand, nodes which represent humans are likely to increase in regard to their betweenness centralities.

These results, more than any of those previous, have obvious suggested implications for an understanding of Albertan literary history. The fact that such a large proportion of the scores for nodes representing humans increased from the bibliographic to the social network indicates that humans likely play an important communicative role in literary social networks, as compared to places and organizations. In other words, the data suggests information in literary communities was likely to be transmitted via people in a societal context. This data specifically indicates that the author Rudy Wiebe is especially important as a communicative hub to the Albertan literary community, and other historical research would likely show that Wiebe was well-connected and played an active role in many different Albertan literary communities. On the other hand, the data also indicates that socially, the author Wilfred Watson does not play any sort of communicative role in the Albertan literary communities. However, as the betweenness

centrality score for Watson fell entirely to 0.0, it is more likely that one is observing a possible gap in the data, as other external research points to Watson as a notable member of Albertan literary circles, and all other nodes representing humans increased in regard to betweenness centrality in the social network from the bibliographic network.

Thus far, the overall structure of the networks and individual nodes common to both the 1975 bibliographic network and the 1975 social network have been compared. The final area which requires comparison between networks is the edges which connect the various nodes. By comparing the edges connecting the nodes in the network, one may ascertain whether the identified relationships between nodes are the same relationships that are identified in the literary social network. This will, in turn, help determine the bibliographic network's ability to identify the features of a social network.

When the edges of the networks are compared, one sees that there are virtually no edges representing the same relationships in the two different networks. For example, although the node representing Rudy Wiebe connects to Paul Thompson in the 1975 bibliographic network, there is no edge connecting Rudy Wiebe and Paul Thompson in the 1975 social network. In fact, there is only one edge common to both the bibliographical network and the social network: the node representing the publisher New Press connects with the node representing Toronto ON. All other connections between the nodes are unique to either the bibliographic or the social network.

The results of this comparison reveal a stark disconnect between the relationships represented in the network as edges. However, as discussed previously, the bibliographic data collected for this project was not confined to the year 1975. Instead, the bibliographic data extends from 1975 through 1979. While comparing the bibliographic network with the social network through a one-to-one comparison, utilizing only the bibliographic data from 1975 was

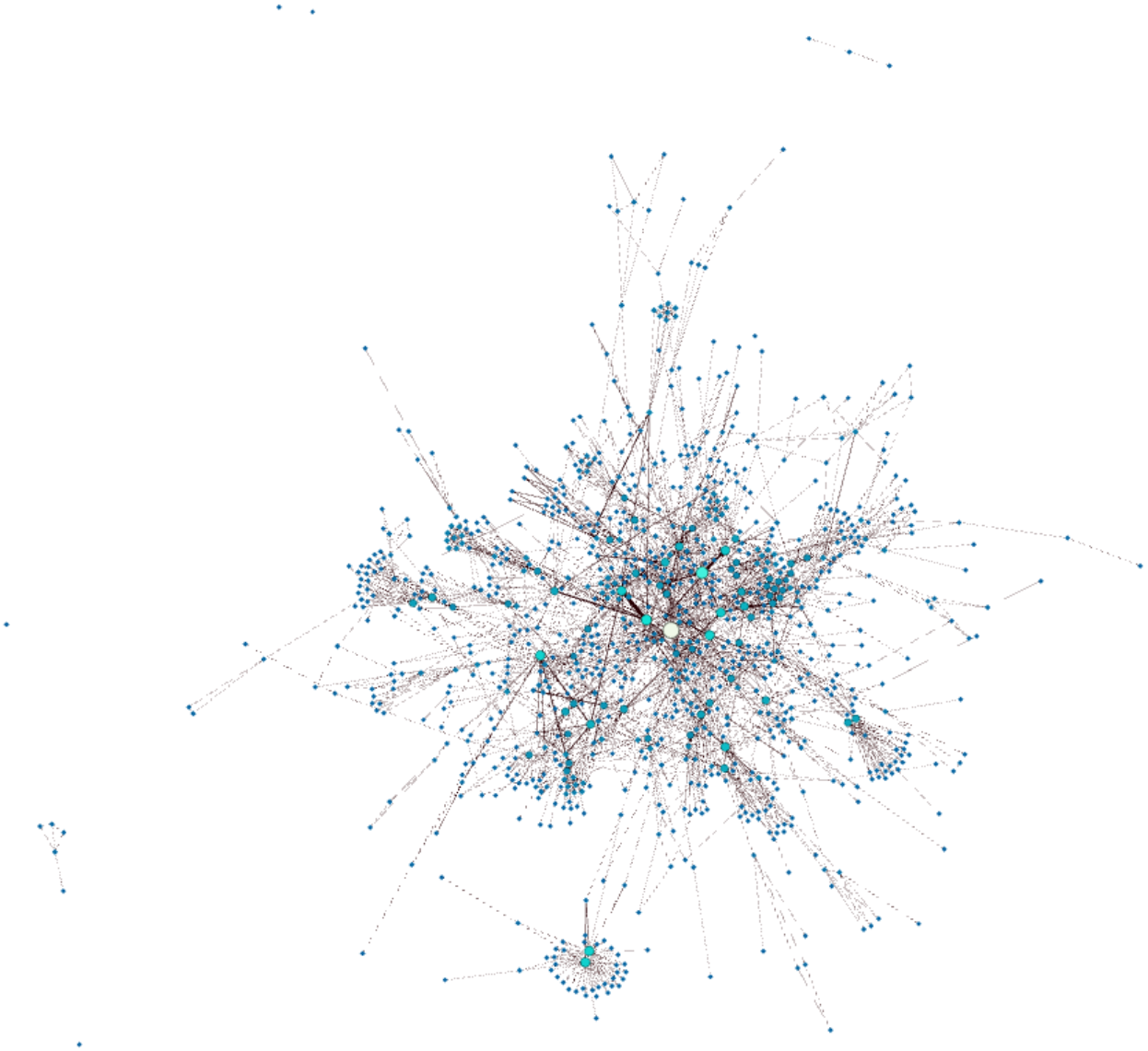
necessary, because to create a social network spanning from 1975 through 1979 was unrealistic in terms of the scope and size of this project. However, by expanding the bibliographic network from 1975 through 1979, it is possible to perceive a more comprehensive bibliographic dataset. In other words, more information about the people, places and organizations may be included in a bibliographic network that spans a five year period than a one year period. As a result, it is possible that persons who were included in the social network and were actively involved in Albertan literary communities in 1975 may not have appeared in the 1975 bibliographic network, because many active writers do not publish every year, and their inclusion in the bibliography network is contingent upon their publication process. By expanding the bibliographic network to five years, the bibliographic data is more likely to engage with authors who are actively working during a time period, even if they have not formally published during a discrete portion of that time period. Thus, by examining the literary social network in relation to a bibliographic network containing work by Albertan authors from 1975 through 1979, more common relationships between the networks may be revealed.

Network of Bibliographic Data, 1975-1979

This network consists of bibliographic data from works created by Albertan authors between 1975 and 1979, and is intended to be used to explore the relationships between the contents of the social network and the bibliographic networks. This network is visualized in Figure 14.

Figure 14

A Network of Bibliographic Data, 1975-1979



Note. The nodes in this figure are weighted by degree: the nodes with the most connections are large and light blue, while the nodes with less connections are small and dark blue. Generated with Gephi.

Results, Network of Bibliographic Data, 1975-1979

The bibliographical network consisting of texts from 1975 to 1979 (Figure 14) contains 973 nodes and 2303 edges. The diameter of the network is 12, with an average path length of 0.679. The graph density is 0.0005. The network has 12 weakly connected components. When assigned

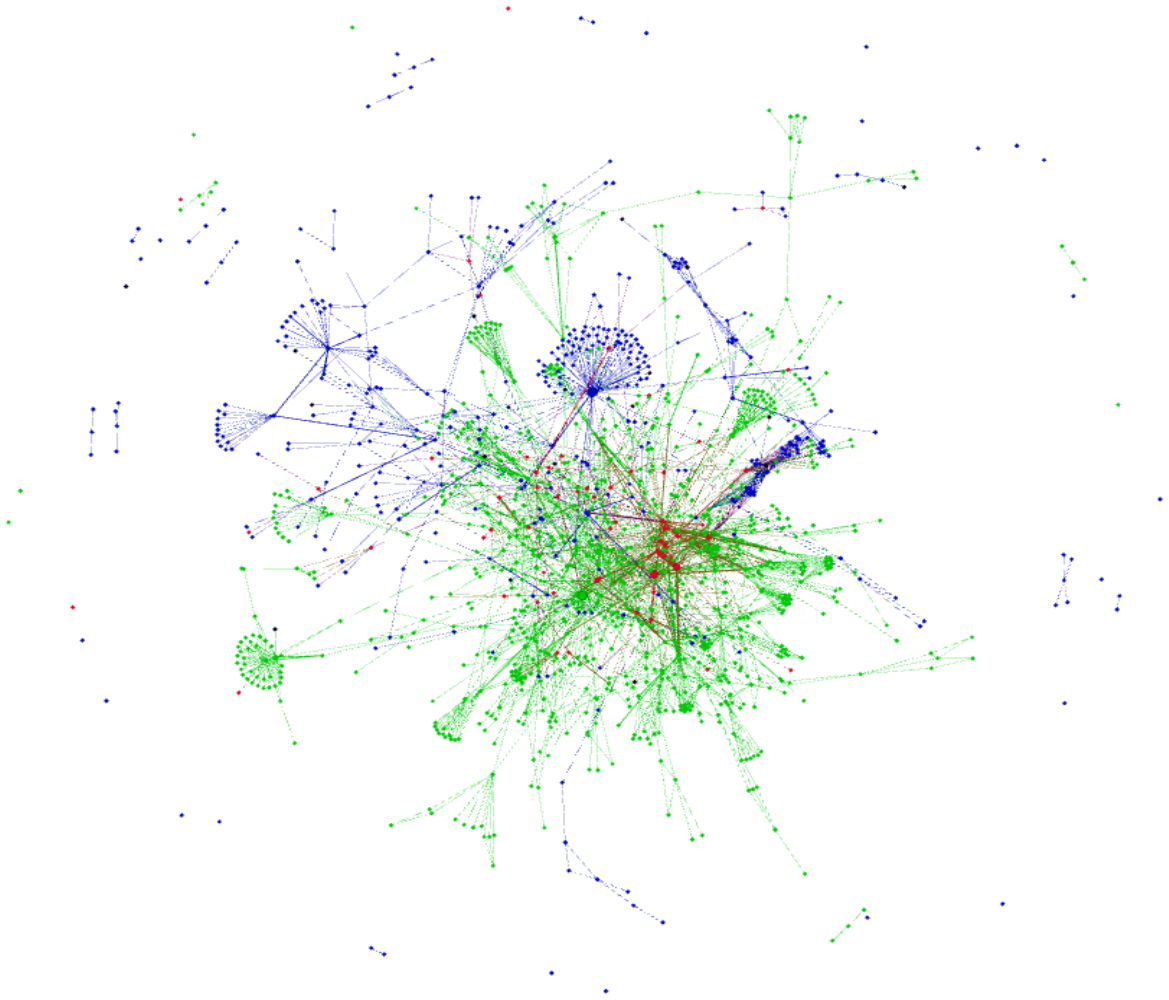
a resolution of 1.0, the graph modularity is 0.772, and divides into 33 communities, ranging from approximately 3 to 125 members in each. The average clustering coefficient is 0.598. The average degree is 4.734, while the average weighted degree is 4.976. One node has an eccentricity measure of 6.0, Aritha van Herk, indicating that this author is structurally positioned as the most central node in the network. However, 44 other nodes have an eccentricity measure of 7.0. Three nodes have a closeness centrality score of 1.0: *Beyond the Tangled Mountain*, Barry McKinnon, and *interlude of love: a poem story*. The ten nodes with the largest eigenvector centrality are *The Alberta Diamond Jubilee Anthology*, Edmonton AB, Theatre 3, Rudy Wiebe, *Far As the Eye Can See*, the Canada Council for the Arts, Toronto ON, *The Komagata Maru Incident,* and Paul Thompson. Finally, the ten nodes with the largest betweenness centrality are *The Alberta Diamond Jubilee Anthology,* Edmonton AB, the Canada Council for the Arts, Calgary AB, Toronto ON, Rudy Wiebe, *Settling Matters,* Robert Kroetsch, the University of Alberta, Caterina Edwards, and New Press.

There are a few aspects of this network that are worth being cognizant of, especially in relation to the bibliographic network of 1975. Most significantly, when one looks at the nodes which have the most central eccentricities, and the largest closeness, eigenvector, and betweenness centralities in this network, they are entirely different from the nodes holding the same positions in the bibliographic network of 1975, primarily because these nodes were not included in the dataset belonging to works published in 1975. Instead, they are derived from works published between 1976 and 1979. In other words, the bibliographic network covering 1975 through 1979 encompasses more members of Albertan literary communities, and thus, by extension, more relationships between these community members. Therefore, does this network reveal more relationships between actors in the networks that are common with the literary social

network, indicating that a bibliographic network has the ability to identify notable characteristics of a social network? To answer this question, a final network visualization overlaying the literary social network on the bibliographic network, 1975-1979 was generated (Figure 15).

Figure 15

Literary Social Network of Alberta, 1975, and Bibliographic Social Network of Alberta, 1975-1979



Note. This network has been weighted by degree, so nodes with the most connections appear the largest. It has also been partitioned by network of origin. Blue nodes represent data from the social network, green nodes are from the bibliographic network, and red nodes represent actors who appear in both networks. Generated with Gephi

Literary Social Network of Alberta, 1975, and Bibliographic Social Network of Alberta, 1975-1979

This combined bibliographic and social network was generated from the Literary Social Network of Alberta, 1975 (Figure 5), and the Network of Bibliographic Data, 1975-1979 (Figure 14). In this visualization, blue nodes represent data from the social network, green nodes are from the bibliographic network, and red nodes represent actors who appear in both networks. It has been generated with the primary aim of comparing the raw content of both networks, that is, what nodes and edges are held in common between the networks. To perform this comparison, the network visualization has been filtered to include only nodes and edges that are common between both the bibliographic network, 1975-1979 and the literary social network, 1975 (Figure 16).

Results, Literary Social Network of Alberta, 1975, and Bibliographic Social Network of Alberta, 1975-1979

When one compares the relationships that are held in common between the nodes in the literary social network of Alberta, 1975, with the larger bibliographic network encompassing works created between 1975 and 1979, rather than just 1975, one sees that there are a few relationships held in common. The number of nodes common between the networks increased from 15 to 57, and instead of only 1 edge in common between the networks, there are now 37. These edges vary in type. For instance, they describe information as varied as that Eli Mandel worked at the Banff School of Fine Arts, that Rudy Wiebe worked with Theatre Passe Muraille, that Sid Marty and Andrew Suknaski collaborated with each other, and that the Playwright's Co-op received assistance from the Canada Council for the Arts. As a result, one sees that the bibliographic

network, when expanded to encompass a larger period of time, is able to identify a few relationships common to the literary social network, although it is almost entirely unable to do so

Figure 16

Literary Social Network of Alberta, 1975, and Bibliographic Social Network of Alberta, 1975-1979, Filtered for Common Nodes and Edges

Note. This image is a highly filtered version of the Literary Social Network of Alberta, 1975, and Bibliographic Social Network of Alberta, 1975-1979 (Figure 15), and displays only nodes and edges that are common between the bibliographic network, 1975-1979, and the literary social network, 1975.

on a one-to-one basis when the social network was compared with only the 1975 bibliographic network. Thus, as a result, it is relatively clear that the bibliographic network has a very limited ability to predict the relationships represented in the social network.

Conclusion

This chapter has seen the datasets created from both bibliographical and archival sources transformed into visualized networks. These visualizations include a network of bibliographical information from books published in 1975, a social network based on the literary figures identified in the 1975 bibliographical network, a combined bibliographic and social network from 1975, a network of bibliographical information from books published between 1975 and 1979, and a network overlaying the 1975 social network on the bibliographic network from 1975-1979. These networks not only visualize the data for analysis, but also enable several analytic metrics to be run on the data. The results of these metrics reveal that structurally, in regard to density and clustering, the bibliographical and social networks are similar. However, when studied in regard to metrics such as degree and centrality measures, the results were mixed. Furthermore, when the content of the networks was compared, there was only a slight overlap in the relationships represented in both the bibliographic and social networks. These results will now be further synthesized and discussed to determine to what extent the bibliographical network may identify the characteristics of the literary social network. Furthermore, an examination of the social network in the context of the bibliographical network of the years 1975-1979 will also aid in a further exploration of what these networks can reveal about Albertan literary history.

Chapter 5: Discussion

Can a Bibliographic Network Identify the Characteristics of a Social Network?

There are two major questions driving the research conducted in this thesis. Firstly, can a bibliographic network identify major characteristics of a social network? That is, when the bibliographic data collected from works published by Albertan authors in the 1970s is networked, can the resulting network identify the people, places, and organizations who are members of a corresponding social network, either through the structure or content of the networks? This question draws on two major areas of research: bibliographic studies and network studies. Bibliographic studies are traditionally concerned with tracing methods and patterns in the production and distribution of texts via their associated metadata, while network studies, in the context of literary studies, are used to explore both the production of texts and the dynamics of literary communities. The first question being asked in this thesis combines these two strands, to see if it is possible to use networked bibliographic data to identify the characteristics of a corresponding social network. To answer this question, various networks were used to compare bibliographic networks with a social network. These comparisons appear to indicate that a bibliographic network cannot identify the major characteristics of a corresponding social network. However, to provide a reliable answer to this question, one must first synthesize the results of the comparative analysis, both in their differences and similarities.

The bibliographic and social networks are different first in terms of size. The bibliographic network has a diameter of 12.0 while the social network has a diameter of 14.0. However, as discussed previously, this is not unexpected as bibliographic data is limited in scope by publishing conventions, while the information which builds a social network represents

people's lived experiences and social connections. Thus, it is reasonable to expect that the social network would be larger than the bibliographic network.

The bibliographic and social networks are also different in terms of density, weakly connected components, and path length. The bibliographic network is markedly denser than the social network, meaning that of the possible connections between nodes, far more are realized in the bibliographic network. And yet at the same time, there are more weakly connected components in the bibliographic network than in the social network. In other words, despite the bibliographic network having a greater ratio of internal connectedness, it is more likely to have sections which are isolated from the rest of the network. Thus, while the social network is less connected internally, it is more likely that any individual member of the network will be connected to the main body of the network. Similarly, the bibliographic network also has a longer path length than the social network, indicating that on average, the nodes in the bibliographic network are located further apart from each other than in the social network. In other words, the bibliographic network might have more linkages connecting the nodes, but those nodes are more likely to be isolated, or at least distant from, the other nodes in the network than are the nodes in the social network. Thus, in regard to density, connected components, and path length, the bibliographic network does not anticipate the social network.

In fact, in regard to the overall structure of the networks, the only area in which there is similarity between the bibliographic and social networks is in the area of modularity. The modularity, as mentioned previously, is high in both the bibliographical and social networks with a measure of over 0.8 in both, with only a difference of 1.2% between the networks' modularity measure. In other words, both networks are almost equally as likely to be partitioned into various communities. As mentioned previously, in network theory, the term 'community' in a network

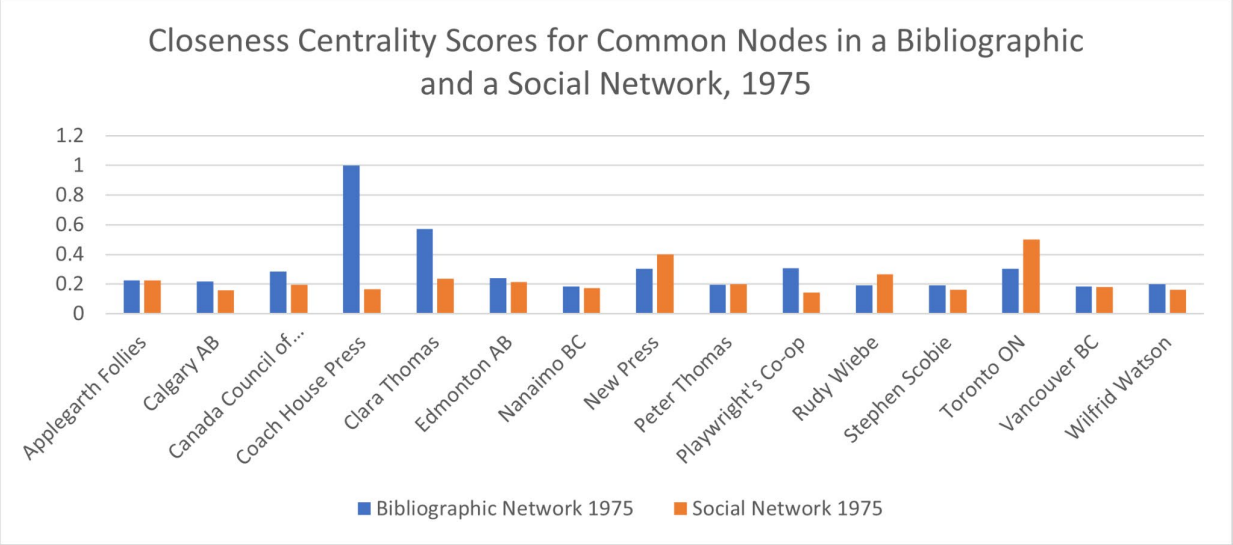
graph refers to distinct clusters of nodes. However, when content of those node clusters are examined, one sees the formation of communities which adhere to the more colloquial definition of the term, that is of a "group sharing common characteristics or interests and perceived or perceiving itself as distinct in some respect from the larger society within which it exists" (Dictionary.com, 2022). In other words, on a purely graphical level, the communities represented might simply be groups of nodes, but when the content of those groups are examined, one sees that they are groups which are semantically linked by commonalities, whether it is through literary interest or occupation between people, or by closeness to a specific person or literary work. For instance, as noted previously, within the social network, one observes a community which forms around the English department at the University of Alberta, while in the bibliographic network, a community forms around the Book Publisher's Association of Alberta. However, both the content of the communities and the connections represented within those communities are not the same between the networks. For instance, as noted earlier, the edges, representing the relationships between the nodes in the network, are not the same in the bibliographic and the social networks. In other words, the nodes which are common between the networks make entirely different connections in the bibliographic network than in the social network, thus clustering and forming entirely different communities. Thus, while the two networks are structurally similar in how they divide into communities, the elements of those communities are very different. This again speaks to an inability of the bibliographic network to identify many major characteristics of the social network.

When one continues comparing the content of the networks through the closeness centrality measure, one sees that the bibliographic network continues to be unable to identify notable elements of the social network. For almost all of the nodes common to both the

bibliographic and social networks, the closeness centrality score changed by a substantial percentage between the two networks. For instance, the closeness centrality of only three nodes changed less than 5% between the bibliographic network and the social network, while the closeness centrality of the majority of the other nodes changed by several percent between the networks:

Figure 17

Closeness Centrality Scores for Common Nodes in the Bibliographic and Social Networks, 1975, Reiterated



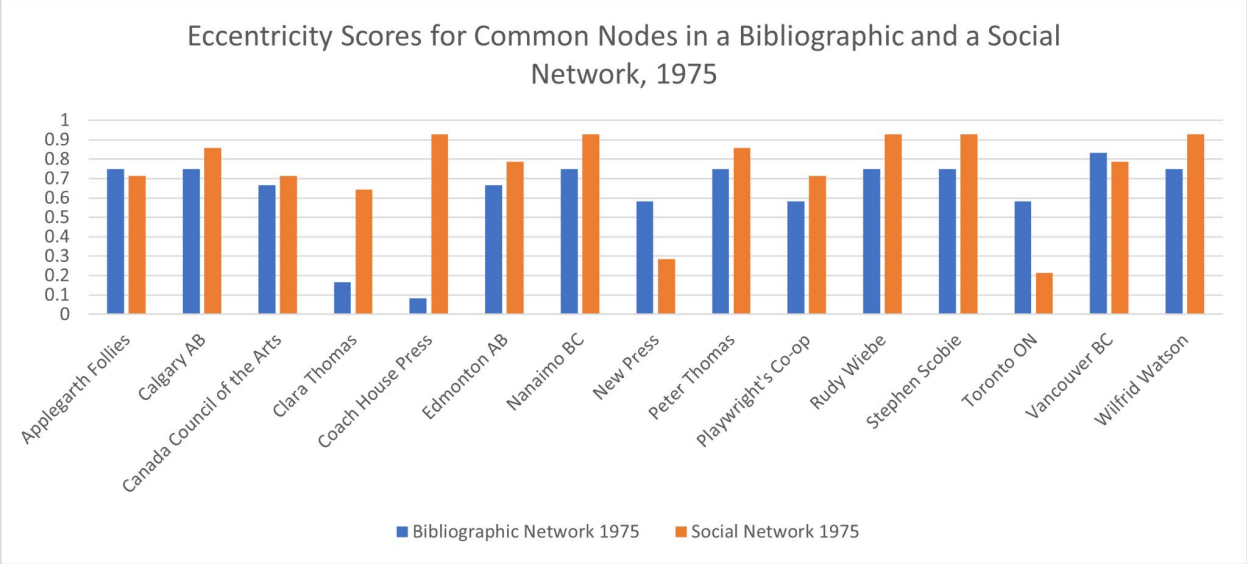
Note. This figure displays the closeness centrality scores of the various nodes in both the bibliographic network, 1975 and its corresponding social network. The scores used to generate the chart are included in Appendix C.

These changes in score occurred no matter what the node represented, whether it was a person, place, or organization. However, there was also no obvious pattern to the change in the nodes' closeness centrality scores; the score may either grow or shrink from one network to the next no matter what the node represents, without consistency between networks. Thus, the closeness centrality scores also cannot be used to identify the level of influence that a node has in the social network based on its influence in the bibliographic network.

However, one finally begins to observe a small level of predictability between networks when one examines the eccentricity, eigenvector centrality and betweenness centrality scores of the nodes common to both the bibliographic and social networks. Like the other nodal metrics, the eccentricity scores of the nodes common to both networks notably change between the networks, with only two nodes' scores changing less than 5%.:

Figure 18

Eccentricity Scores for Common Nodes in the Bibliographic and Social Networks, 1975, Reiterated



Note. This figure displays the eccentricity scores of the various nodes in both the bibliographic network, 1975 and its corresponding social network. The scores used to generate the chart are included in Appendix C.

However, the examination of the eccentricity scores reveals a pattern between the changing scores: when measured according to its eccentricity score, a node is more likely to be positioned closer to the center of the social network than the bibliographic network. In other words, if a node in the bibliographic network is common to the social network as well, that node is twice as likely to be closer to the center of the social network in terms of eccentricity, and four times as likely if the node represents a place. Thus, in this situation, a bibliographic network can predict a

social network in that if a node is common to both networks, a node in the social network is more likely to be in a position of increased importance than its corresponding node in the bibliographic network. Furthermore, from this, one may infer that nodes that the bibliographic network is able to identify in the social network are likely to have at least some significance to the social network, especially when compared to the bibliographic network. While the exact nature of those roles are unknown, one sees that these nodes move to a more central position of the network, which implies that they are more connected to the network as a whole. Being more connected to the network as a whole is important, because it opens the possibility of carrying influence in the network, or of being able to connect otherwise disparate sections of the network. In other words, if a node is common to both the bibliographic and social networks, it is likely that the node will play at least a small role in the social network.

The eigenvector centrality is another measure whose comparison between the bibliographic and social networks indicates that the bibliographic network has some level of ability to predict the social network. One sees that in comparison to the bibliographic network, the eigenvector centrality of nodes in the social network are lower 80% of the time. Furthermore, of those 80% of nodes which have a lower score in the social network, the size of most of the nodes' scores will fall by 91-100%. Thus, one sees that when a node is common to both the bibliographical and social network, the node in the social network will most likely have a lower level of network influence in regard to how connected it is to other nodes of influence. In other words, nodes in the bibliographic network are more likely to hold an influential position in the network in regard to how it is influenced by and can influence others; however, the difference in influence between the networks can be predicted.

At the same time, one must note that the identities of the nodes with the largest eigenvector centrality scores differed between the networks. In other words, the most influential nodes in the bibliographic network of 1975 were not the same nodes who were the most influential in the literary social network. This disqualifies the hypothesis that because the literary social network is larger than the bibliographical network, the influence of a node is simply diffused while retaining the same placement in the network. In other words, one cannot say that a certain node is the most influential in the bibliographical network according to eigenvector centrality, and that while its score, and thus level of influence, was smaller in the social network because of the increased number of nodes to influence in the social network, it was still the most influential node. Thus, the bibliographic network has some ability to predict the change in eigenvector centrality in a specific node when it moves to a social network, but it cannot predict the positioning of that node's level of eigenvector centrality in regard to the other nodes in the social network.

Finally, the change in betweenness centrality scores between the bibliographic and social networks also indicates some level of predictive consistency between the networks. When one compares the betweenness centrality of nodes common to both networks, one sees that if a node represents a human in the network, 60% of the time the betweenness centrality of that score will increase in the social network. One of the greatest strengths of the betweenness centrality score is identifying nodes which facilitate communication between disparate parts of the network, including the identification of bridge nodes which link two otherwise unconnected aspects of the network. Thus, we see that people, rather than places or organizations, are facilitators of communication in the social network, as compared to the bibliographic network.

However, it must be noted that this conclusion is not as obvious as it might appear on the surface. As mentioned previously, according to actor-network theory, any node in a network may act as a facilitator in regard to resource exchange, including communication. Of course, one of the common goals of network theory is to replicate social structures that exist in reality, and thus one expects that the facilitators of communication identified in the network would represent the actors who facilitate communication in lived experience. Common sense might indicate that those communication facilitators would be people, rather than inert institutions or places, making it a reasonable assumption that the nodes identified in the network as facilitating communication represent people.

However, institutions and places also have the ability to promote communication. Institutions, such as publishing houses, can facilitate communication via internal processes that might not be identified in a network, such as through internal messaging systems or via people who work within the institution and are not identified individually in the network. Similarly, places can act as facilitators of communication by acting as point of contact between various people or institutions. Therefore, when the bibliographic network reveals that it is only nodes representing people whose betweenness centrality scores increase when measured in the context of the social network, it is an indication that the only facilitators of communication in the wider social context that the bibliographic data can identify are people. In other words, institutions such as publishing houses play a much smaller role in facilitating communication between writers in a larger social context than they do when linking writers in a purely bibliographic context. Thus, one sees that when one compares the bibliographic and social networks, two-thirds the nodes representing people will act as greater facilitators of information in the social network than they will in the bibliographic network. At the same time, the communication ability of non-human

nodes, as represented by betweenness centrality, will decrease in the social network as compared to the bibliographic network. However, like with the eigenvector centrality score, the betweenness centrality scores are unable to predict the positioning of the nodes in the networks; the nodes with the largest betweenness centrality scores are different in the bibliographic network than in the social network. Therefore, one sees that the bibliographic network has a limited ability to predict the social network in terms of how the betweenness centrality scores differ between networks, but not in which nodes will hold the most influence in the networks.

Therefore, to summarize, the bibliographic network is unable to identify notable characteristics of the social network in terms of size, density, weakly connected components, and path length. The bibliographic network is able to mildly identify aspects of the social network in terms of eccentricity, eigenvector centrality, and betweenness centrality. It is able to identify characteristics of the social network in terms of modularity as expressed structurally, but not in regard to the contents of the communities. Therefore, can the bibliographic network identify major characteristics of the social network in terms of either structure or content?

Essentially, the answer is no, the bibliographic network cannot predict the social network in terms of structure and content. While some predictive patterns have been noted above, those patterns are dwarfed by the number of ways in which the bibliographic and social networks are different in terms of structure and content. The differences in size, density, components, and path length are large enough that even if a bibliographic network could predict the modularity of a network, too much information would be missing to extrapolate the shape or size of a corresponding social network in any way. Similarly, although there are predictive patterns to the way a nodes' role changes from a bibliographic network to a corresponding social network in regard to eccentricity, eigenvector centrality and betweenness centrality, the bibliographic

network cannot predict where those nodes will be positioned within the social network. Therefore, once again, the aspects of a social network that the bibliographic network is able to predict are not enough to extrapolate any meaningful content or structure in a social network.

The inability of the bibliographic network to predict the social network is especially evident when one examines how much content is common between both the bibliographic and social networks. When one combines the contents of both networks (Figure 7, page 49), one sees that out of 614 distinct actors, only 15 nodes are common to both networks (Figure 6, page 55). At the same time, as discussed previously, it is likely that the bibliographic network is unable to fully represent the full range of active writers and publishers in a year, given that works often take multiple years to produce. For this reason, a larger, and thus less granular, bibliographic network was produced, in order to create a more comprehensive bibliographic dataset that would provide a greater range of possible persons, institutions, and places with which to compare the social network. When the social network was combined with the network generated from bibliographic material from 1975 through 1979, the number of nodes in common increased to 57 out of 1386. Thus, one sees that the larger bibliographic network encompasses more elements of the social network, but only by a very small amount. In other words, the vast majority of the actors in the bibliographic networks– 97.6% of the 1975 bibliographic network, and 95.8% of the 1975-1979 bibliographic network- are unique to the respective networks. There is very little content in common between the bibliographic and the social networks. This lack of commonality is especially significant when one considers that these nodes are the only points of contact between the two networks; the nodes common to the two networks are also the nodes which act as bridges between the networks. Thus, any communication or commonality between the

bibliographic and social networks is facilitated by less than 5% of the nodes in the combined networks.

The lack of commonality between the actors in the two networks is perhaps the most surprising aspect of these results. The difference in structure between the networks is likely due to the fact that the social network contains information representing lived experiences that is not formally structured in the manner of bibliographic data. However, it was fully expected that the information contained in the bibliographic network would be more extensively represented in the social network. The expectation was that the majority of the authors represented in the bibliographic data would also be represented in the social network, along with a significant number of the publishers and even some of the spouses noted in dedications and acknowledgements. Instead, only six of the twenty-two possible authors and four of the twenty-one possible publishers were held in common between the bibliographic and social networks of 1975. No family members were represented in the bibliographic network. In short, the contents of the bibliographic network were not represented in the social network. Thus, one may say definitely that a bibliographic network cannot predict a social network in terms of either structure or content.

Exploring the Social Network, 1975

The second question that this thesis was intended to address is the question of what dynamics the visualized networks could reveal about literary communities in Alberta? Networks are a powerful tool for identifying underlying dynamics in communities, including literary communities. Therefore, having generated multiple networks which explore Albertan literary history and communities in order to answer the first question of whether a bibliographic network can identify aspects of a corresponding social network, it is necessary to also examine those

networks in relation to what they reveal about the communities explored in the networks. An examination of the literary social network generated from primary materials created in the year 1975 suggests that the network does not reveal any new information of notable significance about Albertan literary communities. Instead, one observes dynamics that have already been readily observed. For instance, numerous writers in Alberta are linked through their work at the universities, such as Douglas Barbour, Bert Almon and Rudy Wiebe. Other linkages occurred through places and events such as the Banff School of Fine Arts and the Saskatchewan Summer School of the Arts at Fort San SK. Relationships with non-Albertan writers occurred also through various literary programs, such as Canada Day ’75 and A Weekend with Canadian Novelists, where Canadian writers gave readings and ran writing workshops. However, there was nothing unexpected in these results that have not been previously documented in literary histories of Alberta. However, there are two specific subjects whose depiction in the network stand out enough to justify a few brief remarks. These subjects are the dispersion of nodes which represent geographic locations across the network and the presence of libraries in the network.

When the datasets underlying the literary social network of Alberta in 1975 were created, the scope of the data collected was originally confined to writers local to Alberta. This emphasis on geographical limits makes the wide distribution of nodes representing places outside of Alberta across the social network noteworthy enough to warrant exploration. To easily reference the geographical places contained in the literary social network of 1975, a filtered version of the network displaying only geographic nodes is included:

Figure 19

Literary Social Network, 1975, Geographic Nodes

Note. A filtered image of the Literary Social Network, 1975 (Figure 7) depicting only geographic place nodes.

Excluding Alberta, the distribution of places represented by the nodes are concentrated most heavily in Saskatchewan (18.75% of nodes representing a place), the United States (18.75% of the nodes), Ontario (16.7% of the nodes), and British Columbia (14.6% of the nodes). The other nodes represent variously scattered places across Manitoba, Quebec, Prince Edward Island, and Newfoundland, as well as one node representing a link to Germany. Thus, one sees that while the social network originates in Alberta, it is not confined to the province. This speaks to

the nature of the social network as representative of the lived experience of individuals, who often move beyond the places that they live and work, especially as technologies in travel and communication evolve.

Thus, one sees the impactful nature of geographic proximity on a social network. When this network transcends the Albertan border, it moves outward with the most common non-Albertan locations represented in the network being other Western and Central Canadian provinces. The exception to this is the nodes representing locations in the United States. This exception may be accounted for by the notable proportion of the data collected for the networks originating in the Robert Kroetsch fonds. Kroetsch, while an Albertan-born writer whose work often included profiles of the province, lived and worked outside of Alberta in New York State at the University of Binghamton. Thus, because Kroetsch is overrepresented in the network by means of his centrality to the data collected and underlying the social network, the geographical places where Kroetsch lived and worked are also overrepresented in the network.

Therefore, discounting the geographic abnormality created by Kroetsch's preponderance in the network, one sees that the network is geographically centered in Alberta, with the dispersion of nodes representing geographical places moving out from Alberta, primarily first to British Columbia, Saskatchewan, and Ontario and then to other less prominent geographical locations such as Quebec, Newfoundland, Prince Edward Island, and Germany. This geographic dispersion is represented not only by the number of nodes representing these places but also in the connectedness of those nodes as measured by weighted degree. When one examines the ten most connected nodes representing places in the network, the largest proportion of the nodes represent places in Alberta (40%), followed by Saskatchewan (30%) and Ontario (20%). In other

words, Albertan cities have the most connections in the network, followed by their geographic neighbors.

Thus, one sees that geographic proximity plays an important role in the creation of a literary social network: when texts are created within a geographically bound area, the creators of those texts will form more connections within that same geographic area than without, as demonstrated by the dispersion of geographic-representative nodes in the network. Moreover, bibliometric studies discussed earlier state that people who write journal articles are more likely to collaborate with or cite those who work in geographic proximity to each other. Therefore, if writers are more likely to form a social network according to their geographic proximity, they are also more likely to work with those geographically close to them than they are those further away. While this was not demonstrated through the comparison of the bibliographic and social networks, other research such as that by Melnyk (1999), attests to the truth of this statement for writers in 1970s Alberta.

The second subject of note from the literary social network of Alberta is the presence of libraries in the network. In the social network, seventeen organizations outside of publishing houses were identified, and three of those were libraries: the University of Alberta Library, the Vancouver Public Library, and the Saskatoon Public Library. The very fact that multiple libraries in multiple geographic locations exist in the network has implications for an understanding of literary communities in Alberta; namely, that libraries are involved in the literary life of a community. Moreover, there are two different kinds of libraries involved in the network: academic and public. As academic and public libraries fulfill different needs in a community, it suggests that the libraries play more than one role in the literary communities of Alberta.

However, as was noted much earlier, networks often do not provide a complete depiction of a situation and additional context may be required to fully tease apart the nuances of the situation represented by a network. This is especially true of nodes that appear on the periphery of a network, such as the nodes currently under consideration. The nodes representing libraries in the network are generally peripheral to the body of the network, with eccentricities ranging between 11.0 and 13.0 in a network with a diameter of 14.0. Thus, while one cannot make definitive statements about the role that libraries play in Albertan literary communities in 1975, some inferences can be made.

The most significant inference that can be made is the suggestion that libraries act as both disseminators and creators of literary culture. One sees this especially in regard to the Vancouver Public Library, whose role in the network is defined through its link to the event 'A Weekend with Canadian Novelists', a weekend of readings and workshops organized in part by the Vancouver Public Library and the B.C. Teachers' Federation. Through its involvement in this event, one sees that the public library is both a disseminator of literary culture and an educator; writers give readings to audiences, disseminating their works while at the same time teaching school-age children how to write, thus contributing to the future creation of other works. Thus, while the current placement of public libraries in the network might be small and its influence negligible compared to other nodes, one might infer that the long-term influence of public libraries is significant, if unmeasured in the network.

An academic library is also represented in the social network through the University of Alberta Library. In the network, this library is linked to the authors Douglas Barbour and Bert Almon through their volunteer positions on a library committee as part of their work as professors in the English Department at the University of Alberta. However, as noted earlier,

many other Albertan writers were, at one point or another, professors or students at the University of Alberta, and usually as members of the English department. Thus, there is a direct, if implied, link to the University of Alberta Library for several Albertan writers. While further research must be conducted to explore the exact nature of the relationship of these writers to the library, one may assume via the position of this library in the network that the existence of the library was a professional, if peripheral, assumption on the part of many Albertan writers. Moreover, one sees that the library's specific connection to the rest of the network was through the work of writers on a library committee. This implies a level of value assigned to the library by the writers who chose to spend their professional energies supporting the library through this committee. Thus, one may assume that at least some Albertan writers in 1975, especially among those that taught as well as wrote literature, held that libraries are a necessary component of literary education or dissemination that should be supported. However, in order to say this with confidence, one would have to conduct further historical research into specific writers and their attitudes or beliefs regarding libraries.

Limitations

Like any project employing network analysis, the current research has limitations. The most significant limitation is reflected above when observations about the network are made. These observations may suggest possible implications about the data and lines for further research while simultaneously proving unable to provide a conclusive, or even reliable, answer to the questions that they raise. Network analysis, both social and bibliometric, is excellent for addressing the specific questions that they were designed to answer. Here, that question was whether a bibliographic network can identify characteristics of a social network. At the same time, networks may be poor at answering questions that are uncovered incidentally, such as what

defined the relationship of a writer in the 1970s to an academic library, depending on how the original datasets underlying the networks were gathered, organized, and classified. For example, these networks may have been able to more immediately identify the nature of the various relationships that writers had to libraries in the networks if the underlying dataset had assigned ontological classifications to the edges in the network. However, because that preliminary step was not taken, the networks were unable to define those relationships. Thus, networks are powerful tools for analysis, but they may also be limited in their ability to explore some questions depending on the underlying data used to build the network.

Therefore, the major limitation on this research is that the networks are only as accurate as the data from which they are generated. A network can only show the existence of actors and relationships if those actors and relationships are expressed in the data which are used to generate the network. Thus, any data that is excluded from the dataset is excluded from the network. As such, there is a limitation on the research currently being discussed due to the nature of the primary sources underlying the data collection for this project. The subject of the networks used to carry out the research is Albertan literary history in the 1970s. Thus, many of the people whose works appear in the bibliographic network are still living or only recently deceased. As a result, there is a deficit in primary sources with which to build the datasets for generating the networks as many of these primary sources have yet to be donated for archival use as compared to earlier literary periods. While it is entirely possible that the writers or families of the writers whose works are addressed in this research will choose not to allow public access to their documents, it is also likely that over time more might be discovered or donated for research purposes.

At the same time, even if more primary sources become available to compile a more comprehensive view of the literary history of Alberta, it is likely that gaps will remain in the networks. As lived experiences are vast and multifaceted, it is impossible to contain and track a network exactly as it exists in life. Thus, as it stands, the networks used to conduct this research have gaps. Not all connections are recorded, and thus cannot be contained in a network. As it stands, the social network used in this project only includes information gathered from writers who created primary sources that are stored in Albertan archives. Therefore, information generated by non-authorial persons or kept outside of the archival context were not included in the networks, and as a result, the networks likely contain gaps. However, there is little that can be done to fill those gaps except be aware of their existence. A limitation on this project therefore exists in that the nature of the data which forms the basis of the social network used in the project is likely incomplete and cannot currently be made complete. Thus, it is possible that additional nodes and ties exist in the social network which could have implications on the project's results. However, the nature of those ties cannot be known without the missing data, and thus one cannot speculate about the possible implications on the results of this research.

Chapter 6: Conclusion

Through the use of combined bibliographic and social network analysis, this thesis has explored the question of whether a bibliographic network can identify major characteristics of a corresponding social network while also exploring the same networks for insight into Albertan literary history in the 1970s. During the 1960s and ‘70s, literature in Alberta, as in the rest of Canada, was booming. New funding and programs supporting the literary arts, combined with economic and technological developments helped foster literary production in Alberta. This increased literary production in Alberta was marked by various relationships and collaborations among Albertan writers. Therefore, networks mapping both the bibliographic information contained in the front matter of texts written by Albertan authors as well as a social network depicting the relationships among these authors were created to study via comparative analysis.

The comparative analysis was conducted using metrics provided by Gephi, the software used to generate the networks. By comparing the various elements of the networks through metrics such as diameter, degree, path length, eccentricity, and centrality measures, it was made clear that the bibliographic network was not able to identify significant characteristics of the structure or contents of the social network. Subsequent exploration of the networks also revealed that the networks did little to expose new dynamics or information about the literary history of Alberta in the 1970s, although the dispersion of geographic locations and the presence of libraries in the networks warranted a brief investigation.

Although the expected hypotheses were not borne out, in the end this project still provides a valuable contribution to both the fields of digital humanities and library and information studies. Firstly, this project has also highlighted the relational nature of bibliographic data through the study of bibliographic networks. By using networks to study bibliographic data,

the semantically meaningful nature of that metadata is emphasized as the networks visualize its connections and content. Thus, one may recognize that the metadata utilized by libraries, museums, archives and other cultural institutions has a nature that goes beyond mere identification. Instead, metadata is recognized as reflecting aspects of society and culture. Thus, while the information contained in the front matter of a text may not directly identify the exact details of a social network, it is still indicative of lived history and human experience, and thus is a valuable area of study.

Furthermore, by using comparative analysis to study both bibliographic and social networks, this project has shown that network analysis is a viable tool for research in these fields. Indeed, through the use of network analysis, people and organizations of notable connectedness and influence in the Albertan literary communities in the 1970s were identified, even if the contributions of these people and organizations have already been well documented. Indeed, the fact that previously recognized research has been reflected in the results from the network analysis speaks to the feasibility of using network analysis as a methodological tool, as it shows that it can replicate results found via other established methods of research. Thus, while the results of this research did not confirm the original expectations, it remains a demonstrable example of the value of bibliographic and network studies to the fields of digital humanities and library and information studies.

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Appendix A

List of Texts Contained in the Bibliographic Networks by Year

Texts Published in 1975 by an Albertan Author

Baldridge, M.H. (1975). *The Photographic Moment.* Playwright's Co-op.

Blodgett, E.D. (1975). *take away the names.* Coach House Press.

Botting, G. (1975). *Lady Godiva on a Plaster Horse.* Red Deer College Press.

Cecil, D.P. (1975). *Beyond the Tangled Mountain.* Horizon House.

DeFelice, J. (1975). *Fools and Masters.* Playwright's Co-op.

DeFelice, J. (1975). *Take Me Where the Water's Warm.* Playwright's Co-op.

Duciaume, J. & Gravel, F. (1975). *Et le verbe s'est fait chair.* Les Editions de l'*Églantier.*

Eggleston, W. (1975). *The High Plains*. Borealis Press, Ltd.

Germain, C. (1975). *Singing Your Song.* White Pelican Press.

Graves, W. (1975). *Chief Shaking Spear Rides Again, or, the Taming of the Sioux.* Playwright's Co-op.

Groves, E.M. (1975). *Poetic Reflections.* n.p.

Jones, S. (1975). *Ready Steady Go. A Play.* Playwright's Co-op.

Kitsco, J.P. (1975). *Canadian Poetry. Tears.* New Press.

Kreisel, H. (1975). *The Rich Man.* Simon & Schuster of Canada.

Kroetsch, R. (1975). *Badlands. A Novel.* New Press.

Kroetsch, R. (1975). *The Ledger.* Applegarth Follies.

Kroetsch, R. (1975). *The Stone Hammer Poems: 1960-1975.* Oolichan Books.

McNamara, E. (1975). *In Transit.* The Pennyworth Press.

Moher, F. (1975). *Pause*. Playwright's Co-op.

Murphy, E. (1975). *Janey Canuck in the West.* McClelland & Stewart.

Potrebenko, H. (1975). *A Flight of Average Persons.* New Star Books.

Potrebenko, H. (1975). *Taxi!* New Star Books.

Ringwood, G.P. (1975). *The Rainmaker.* Playwright's Co-op.

Scobie, S. (1975). *Air Loom.* Seripress.

Snyder, W. (1975). *The Battle Hymn of the Dominion and Other Poems.* Red Deer College Press.

Snyder, W. (1975). *Waitress! There's an Eye in my Soup!* Red Deer College Press.

Texts Published in 1976 by an Albertan Author

Almon, B. (1976). *Taking Possession. Poems.* Solo Press.

Ballem, J. (1976). *The Judas Conspiracy*. Musson Book Company.

Bugnet, G. (1976). *The Forest.* (D. Carpenter, Trans.). Harvest House.

Crichton, N. (1976). *Rerun.* Musson Book Company.

Gom, L. (1976). *The Singletree.* Sono Nis Press.

Kirman, J.M. (1976). *Saga of Canada.* n.p.

Jakober, M. (1976). *The Mind Gods*. Macmillan of Canada.

Latta, W. (1976). *Summer's Bright Blood: Selected Poems by William Latta*. Thistledown Press.

Ratner, R. (1976). *The Tightrope Walker.* Pennyworth Press.

Riis, S. (1976). *The True Story of Ida Johnson.* The Women's Press.

Ringwood, G.P. (1976). *Widger's Way.* Playwright's Co-op.

Ryga, G. (1976). *Night Desk.* n.p.

Sikabonyi, L.A. (1976). *The Billion Dollar Oil Swindle.* Exposition Press.

Slavutych, Y. (1976). *L'Oiseau de Feu (Poèmes Choisis)*. Edition des Deux Mondes, Slavuta

Publishers.

Smiley, G. (1976). *The Art of Communication: Three Plays.* Playwright's Co-op.

Smith, M. (1976). *Koo-koo-sint: David Thompson in Western Canada.* Red Deer College Press.

Twa. J. (1976). *Let's Play Northern Pole.* Harden House.

Texts Published in 1977 by an Albertan Author

Baldridge, M.H. (1977). *The Suicide Meet.* Playwright's Co-op.

Barbour, H. (1977). *Visions of my Grandfather*. Golden Dog Press.

Bhatia, J. (1977). *Liverpool Daisy.* Peter Hale.

Blodgett, E.D. (1977). *Sounding.* Treefrog Press.

Carpenter, D. (Ed.). (1977). *Wild Rose Country: Stories from Alberta.* Oberon Press.

Carter, D. (1977). *Prairie Profiles*. n.p.

Chapman, E. (1977). *Poems for People over 25.* Pedlar Press.

Dyba, K. *Sister Roxy.* November House.

Fairbairn, J.L. (1977). *Rhymes of a Prairie Scot.* n.p.

Gedge, P. (1977). *Child of the Morning.* Macmillan Canada.

Getting Here: Stories Selected by Rudy Wiebe. (1977). NeWest Press.

Harker, H. (1977). *Turn Again Home.* Random House.

Harker, R. (1977). *Adrift.* Random House.

Henry, J. (1977). *interlude of love: a poem story.* n.p.

Kinsella, W.P. (1977). *Dance Me Outside.* Oberon Press.

Kroetsch, R. (1977). *Seed Catalogue.* Turnstone Press.

LeMay, B. (1977). *Roundhouse. A Comedy.* Playwright's Co-op.

Latta, W. (1977). *Drifting into Grey.* Four Humours Press.

Lawrence, K.A. (1977). *Nekuia. The Inanna Poems.* National Library of Canada.

Mandel, M. (1977). *Station 14.* NeWest Press.

Morrisette, G. (1977). *Prairie Howl.* NeWest Press.

O'Hagan, H. (1977). *The School-Marm Tree.* Talonbooks.

Ryga, G. (1977). *Ploughman of the Glacier.* Talonbooks.

Ryga, G. (1977). *Seven Hours to Sundown.* Talonbooks.

Simon, O.E. (1977). *Curse of the Gods.* Veritas International Publishing Ltd.

Wade, B. (1977). *This Side of the Rockies.* Playwright's Co-op.

Wiebe, R. & Theatre Passe Muraille. (1977). *Far As the Eye Can See.* NeWest Press.

Texts Published in 1978 by an Albertan Author

Annett, R.R. (1978). *Especially Babe.* Appleton-Century.

Baldridge, M.H. (1978). *the loneliness of the poet/housewife.* Fiddlehead Poetry Books.

Ballem, J. (1978). *The Moon Pool*. McClelland & Stewart.

Barbour, D. (1978). *The Story So Far, 5.* Coach House Press.

Bugnet, G. (1978). *Poèmes*. Les Editions de l'*Églantier*

Cullen, M. (1978). *The Curried Chicken Apocalypse*. Thistledown Press.

Daniel. L. (1978). *Towards a New Compass.* Thistledown Press.

Dragland, S. (1978). *Peckertracks. A Chronicle.* Coach House Press.

Eggleston, W. (1978). *Prairie Symphony.* Borealis Press.

Gedge, P. (1978). *The Eagle and the Raven.* Macmillan of Canada.

Graves, W. (1978). *Scrooge.* Playwright's Canada.

Graves, W. (1978). *Who's Looking After the Atlantic & The Proper Perspective: Two Plays.* Playwright's Co-op.

Guest, W. (1978). *Poetic Fancies.* n.p.

Hardy, W.G. (1978). *The Scarlet Mantle*. Macmillan of Canada.

Hare, J.A., Lowry, M., Moir, J.M., & Williamson, H. (1977). *Interface*. H. Williamson.

Harrison, D. (1978). *Best Mounted Police Stories.* The University of Alberta Press.

Kinsella, W.P. (1978). *Scars*. Oberon Press.

Kitsco, J. (1978). *Looking Back.* New Press.

Kroetsch, R. (1978). *What the Crow Said.* General Publishing Co. Ltd.

Moon, B.R. (1978). *Fourling. Four Short Stories.* National Library of Canada.

Noble, C. (1978). *Haywire Rainbow*. Press Porcepic Ltd.

Pariseau, J. (1978). *Albertaines images…* . n.p.

Pariseau, J. (1978). *L'envers de jours.* Les Editions de l'*Églantier.*

Pollock, S. (1978). The Komagata Maru Incident. Playwright's Canada.

Pollock, S. (1978). The Wreck of the National Line. Playwright's Co-op.

Redl-Hlus, C.D. (1978). *Earthbound*. Borealis Press.

Reid, M.G. (1978). *The Book of Definition.* National Library of Canada.

Scobie, S. (1978). *Airwaves, Sealevel, Landlock.* Seripress.

Toth, N. (1978). *Pattern Without End (Poems 1965-1970).* Academic Printing & Publishing.

Uher, L. (1978). *Crow's Black Joy.* NeWest Press.

van Herk, A. (1978). *Judith.* McClelland & Stewart.

van Herk, A. (1978). *When Pigs Fly.* National Library of Canada.

Watson, W. (1978). *I Begin with Counting*. NeWest Press.

Williamson, H. (Ed.). (1978). *Interface tu: 10 Calgary Poets.* n.p.

Texts Published in 1979 by an Albertan Author

Baldridge, M.H. (1979). *The Mary Shelley Play.* Playwright's Co-op.

Barbour, D. (1979). *shorelines.* Turnstone Press.

Botting, G. (1979). *Freckled Blue and Other Poems.* n.p.

Chalmers, J., Moir, J., Bhatia, J. & Dempsey, H.A. (Eds.). (1979). *The Alberta Diamond Jubilee Anthology: A Collection from Alberta's Best Writers.* Hurtig.

Forrester, H. (1979). *Minerva's Stepchild.* Bodley Head.

Govier, K. (1979). *Random Descent.* Macmillan of Canada.

Hardy, W.G. (1979). *The Bloodied Toga.* Macmillan of Canada.

Kroetsch. R. (1979). *The Sad Phoenician.* Coach House Press.

MacDonald, C. (1979). *Once Upon a Childhood.* Kingfisher Press.

McHugh, D. (1979). *Edmonton is Burning.* Puckrin's Production House.

Mitchell, K. (1979). *Davin: The Politician.* NeWest Press.

Morton, C.T. (1979). *Standing in the Street.* University of Alberta.

Moure, E. (1979). Empire, York Street. Anansi.

Reid, M. (1979). *Karst Means Stone.* NeWest Press.

Settling Matters. (1979). n.p.

van der Mark, C. (1979). *In Due Season*. New Star Books.

Walter-Toews, D. (1979). *The Earth is One Body.* Turnstone.

Watson. S. (1979). *Four Stories*. Coach House Press.

Wiebe, R. (1979). *The Scorched Wood People.* McClelland & Stewart.

Wright, L.R. (1979). *Neighbors.* Macmillan of Canada.

Examples of Front Matter Collected from a Text

From Blodgett, E.D. (1975). *take away the names.* Coach House Press.

Title: take away the names
Author: e.d. Blodgett
Publisher: Coach House Press
Dedication: for Elke
Inscription: To my friend Jean Marech, who loves these things. Ted. (Translated from French)
Cover Photo: Alice Baumann-Rondez

From Hardy, W.G. (1979). *The Bloodied Toga.* Macmillan of Canada

Title: The Bloodied Toga
Author: W.G. Hardy
Publisher: Macmillan of Canada
Place of Publication: Toronto ON
Dedication: to Margaret Coleman Johnson (assistant editor/ friend)
Acknowledgements: Margaret Coleman Johnson (assistant editor); Kay M. Baert (typist); Pat Kennedy (editor); Douglas M. Gibson; Robert Stuart
Jacket Illustration: Leong O'Young
Author Photo: Robert Stuart
Endpaper Map: Charles Hilder
Jacket Design: Richard Miller

Appendix B

Dataset Samples

Table B1

Dataset Selection, Bibliographic Network, 1975, Nodes

ID	Label	Ref
15	Alice Baumann-Rondez	Person
16	Annie Jessamine (Mrs. Ferguson Burke)	Person
17	Anton Wagner	Person
18	Barbara Caruso	Person
19	Bernard Germain	Person
20	Bonnie Le May	Person
21	Clara Thomas	Person
22	Claude Germain	Author
23	Douglas Cecil Percy	Author
24	Douglas Riske	Person
25	Wilfrid Eggleston	Author
26	E.D. Blodgett	Author
27	Earl Seymore Trio	Person
28	Edythe M. Groves	Person
29	Ellen Eggleston	Person
30	Emily Murphy	Author
31	Eugene McNamara	Author
32	Francine Gravel	Author
33	Frank Moher	Author
34	Gary Botting	Author
35	Gordon Hancock	Person
37	Gwen Pharis Ringwood	Author
38	Heinrich Eichner	Person
39	Helen Potrebenko	Person
40	Henry Kreisel	Author
41	Hilary Bates	Person
42	Isabel Bassett	Person
43	Jack Ackroyd	Person
44	James DeFelice	Author
45	Janet Laine-Green	Person
46	Jean-Marcel Duciaume	Author
47	John Phillip Kitsco	Author
48	Joseph Acs	Person
49	Joy Leach	Person
50	Lilian Harrison	Person
51	Lillian McCallum	Person
52	MacLean Jamieson	Person
53	Marc Vasey	Person

Table B2
Dataset Selection, Bibliographic Network, 1975, Edges

Source	Target	Type	From	To
144	107	Undirected	Canadian Poetry. Tears	New Press
144	92	Undirected	Canadian Poetry. Tears	Red Deer AB
119	147	Undirected	Canadian Theatre Review	Dark Harvest
119	17	Undirected	Canadian Theatre Review	Anton Wagner
145	81	Undirected	Chief Shaking Spear Rides Again	Warren Graves
145	111	Undirected	Chief Shaking Spear Rides Again	Playwright's Co-op
145	94	Undirected	Chief Shaking Spear Rides Again	Toronto ON
145	12	Undirected	Chief Shaking Spear Rides Again	Walterdale Theatre Associates
22	82	Undirected	Claude Germain	Wilfred Watson
22	51	Undirected	Claude Germain	Lilliam McCallum
22	116	Undirected	Claude Germain	White Pelican Press
101	15	Undirected	Coach House Press	Alice Baumann-Rondez
147	17	Undirected	Dark Harvest	Anton Wagner
24	72	Undirected	Douglas Riske	Roy Warhurst
26	101	Undirected	E.D. Blodgett	Coach House Press
103	86	Undirected	Editions de l'Eglantier	Edmonton AB
103	46	Undirected	Editions de l'Eglantier	Jean-Marcel Duciaume
103	32	Undirected	Editions de l'Eglantier	Francine Gravel
28	93	Undirected	Edythe M. Groves	Strathmore ON

Source	Target	Type	From	To
30	16	Undirected	Emily Murphy	Annie Jessamine (Mrs. Ferguson Burke)
148	46	Undirected	Et le verbe s'est fait chair	Jean-Marcel Duciaume
148	86	Undirected	Et le verbe s'est fait chair	Edmonton AB
148	103	Undirected	Et le verbe s'est fait chair	Editions de l'Eglantier
148	32	Undirected	Et le verbe s'est fait chair	Francine Gravel
31	98	Undirected	Eugene McNamara	Windsor ON
31	110	Undirected	Eugene McNamara	Pennyworth Press
149	44	Undirected	Fools and Masters	James DeFelice
149	111	Undirected	Fools and Masters	Playwright's Co-op
149	94	Undirected	Fools and Masters	Toronto ON
133	85	Undirected	Forty-Ninth Street Theatre Company	Calgary AB
33	111	Undirected	Frank Moher	Playwright's Co-op
33	86	Undirected	Frank Moher	Edmonton AB
33	133	Undirected	Frank Moher	Forty-Ninth Street Theatre Company
34	112	Undirected	Gary Botting	Red Deer College Press
10	85	Undirected	Glenbow Foundation	Calgary AB
37	111	Undirected	Gwen Pharis Ringwood	Playwright's Co-op
37	97	Undirected	Gwen Pharis Ringwood	Williams Lake, BC
37	147	Undirected	Gwen Pharis Ringwood	Dark Harvest
37	55	Undirected	Gwen Pharis Ringwood	Maryo Thimball Gard

Table B3
Dataset Selection, Social Network, 1975, Nodes
*Partially anonymized to protect individual persons according to the Personal Information Protection Act

ID	Source	Target
1.8	Anonymous25	Person
78	Anonymous26	Person
79	Anonymous27	Person
80	Anonymous28	Person
81	Anonymous5	Person
82	Anonymous60	Person
83	Anonymous29	Person
84	Anonymous30	Person
373	Anonymous61	Person
85	Anonymous31	Person
86	Anonymous3	Person
87	Anonymous32	Person
88	Anonymous6	Person
89	Anonymous33	Person
1.9	Anonymous34	Person
1.101	Anonymous17	Person
91	Anonymous35	Person
92	Anonymous36	Person
93	Anonymous37	Person
94	Anonymous38	Person
95	Anonymous39	Person
96	Anonymous40	Person
1.11	Anonymous67	Person
97	Anonymous41	Person
98	Anonymous42	Person
99	Anonymous43	Person
100	Anonymous44	Person
101	Anonymous45	Person
376	Anonymous46	Person
102	Anonymous47	Person
375	Anonymous48	Person
103	Anonymous49	Person
104	Anonymous50	Person
1.12	Anonymous18	Person
105	Anonymous51	Person
1.13	Anonymous52	Person
106	Anonymous53	Person
107	Anonymous54	Person
108	Anonymous55	Person

Table B4
Dataset Selection, Social Network, 1975, Edges
*Partially anonymized to protect individual persons according to the Personal Information Protection Act

Source	Target	Type	From	To
1.8	1.6	Undirected	Anonymous25	AnonOrg1
1.8	1.47	Undirected	Anonymous25	Anonymous56
1.8	1.34	Undirected	Anonymous25	Anonymous57
78	335	Undirected	Anonymous26	AnonOrg2
78	252	Undirected	Anonymous26	Anonymous59
78	335	Undirected	Anonymous26	AnonOrg2
81	252	Undirected	Anonymous5	Anonymous59
81	307	Undirected	Anonymous5	AnonPlace1
82	252	Undirected	Anonymous60	Anonymous59
82	283	Undirected	Anonymous60	AnonPlace2
82	324	Undirected	Anonymous60	AnonPlace3
82	379	Undirected	Anonymous60	AnonOrg3
373	7	Undirected	Anonymous61	AnonOrg4
373	237	Undirected	Anonymous61	Anonymous58
373	82	Undirected	Anonymous61	Anonymous60
85	252	Undirected	Anonymous31	Anonymous59
85	14	Undirected	Anonymous31	AnonOrg5
85	372	Undirected	Anonymous31	AnonPlace4
88	252	Undirected	Anonymous6	Anonymous59
88	357	Undirected	Anonymous6	AnonOrg6
88	337	Undirected	Anonymous6	AnonOrg7
1.9	1.4	Undirected	Anonymous34	AnonOrg8
1.9	1.36	Undirected	Anonymous34	Anonymous62
1.9	1.31	Undirected	Anonymous34	Anonymous63
1.9	1.21	Undirected	Anonymous34	Anonymous64
1.9	1.17	Undirected	Anonymous34	Anonymous65

Appendix C

Data Metric Results for Nodes Common to the Bibliographic Network, 1975, and the Literary Social Network, 1975

Table C1

Applegarth Follies Data Metrics

	Bibliographic Network 1975	Social Network 1975
Degree	5	2
Weighted Degree	5	2
Eccentricity	9.000000	10.000000
Closeness Cent.	0.223810	0.225361
Eigenvector Cent.	0.175681	0.010594
Betweenness Cent.	0.012615	0.003686

Table C2

Calgary AB Data Metrics

	Bibliographic Network 1975	Social Network 1975
Degree	7	3
Weighted Degree	7	3
Eccentricity	9.000000	12.000000
Closeness Cent.	0.218944	0.159101
Eigenvector Cent.	0.101047	0.006096
Betweenness Cent.	0.043617	0.007352

Table C3

Canada Council of the Arts Metric Results

	Bibliographic Network 1975	Social Network 1975
Degree	9	5
Weighted Degree	9	5
Eccentricity	8.000000	10.000000
Closeness Cent.	0.284274	0.196027
Eigenvector Cent.	0.458102	0.024030
Betweenness Cent.	0.167673	0.000604

Table C4

Coach House Press Data Metric Results

	Bibliographic Network 1975	Social Network 1975
Degree	3	2
Weighted Degree	3	2
Eccentricity	1.000000	13.000000
Closeness Cent.	1.000000	0.166445
Eigenvector Cent.	0.015063	0.003899
Betweenness Cent.	0.000031	0.000000

Table C5

Clara Thomas Data Metric Results

	Bibliographic Network 1975	Social Network 1975
Degree	2	1
Weighted Degree	2	1
Eccentricity	2.000000	9.000000
Closeness Cent.	0.571429	0.237793
Eigenvector Cent.	0.025178	0.071651
Betweenness Cent.	0.000000	0.000000

Table C6

Edmonton AB Data Metric Results

	Bibliographic Network 1975	Social Network 1975
Degree	9	4
Weighted Degree	9	4
Eccentricity	8.000000	11.000000
Closeness Cent.	0.240614	0.213432
Eigenvector Cent.	0.205499	0.009301
Betweenness Cent.	0.101799	0.013918

Table C7

Nanaimo BC Data Metric Results

	Bibliographic Network 1975	Social Network 1975
Degree	1	5
Weighted Degree	1	5
Eccentricity	9.000000	13.000000
Closeness Cent.	0.184073	0.172572
Eigenvector Cent.	0.031730	0.016601
Betweenness Cent.	0.000000	0.007352

Table C8

New Press Data Metric Results

	Bibliographic Network 1975	Social Network 1975
Degree	6	4
Weighted Degree	6	4
Eccentricity	7.000000	4.000000
Closeness Cent.	0.303226	0.400000
Eigenvector Cent.	0.275850	0.005650
Betweenness Cent.	0.239828	0.000355

Table C9

Peter Thomas Data Metric Results

	Bibliographic Network 1975	Social Network 1975
Degree	1	4
Weighted Degree	1	5
Eccentricity	9.000000	12.000000
Closeness Cent.	0.195833	0.198834
Eigenvector Cent.	0.029595	0.008587
Betweenness Cent.	0.000000	0.011027

Table C10

Playwright's Co-op Data Metric Results

	Bibliographic Network 1975	Social Network 1975
Degree	18	1
Weighted Degree	20	1
Eccentricity	7.000000	10.000000
Closeness Cent.	0.308534	0.143843
Eigenvector Cent.	0.565682	0.001853
Betweenness Cent.	0.173489	0.000000

Table C11

Rudy Wiebe Data Metric Results

	Bibliographic Network 1975	Social Network 1975
Degree	4	5
Weighted Degree	4	7
Eccentricity	9.000000	10.000000
Closeness Cent.	0.190798	0.265393
Eigenvector Cent.	0.050209	0.032460
Betweenness Cent.	0.008471	0.198992

Table C12

Stephen Scobie Data Metric Results

	Bibliographic Network 1975	Social Network 1975
Degree	2	17
Weighted Degree	2	19
Eccentricity	9.000000	13.000000
Closeness Cent.	0.190798	0.160875
Eigenvector Cent.	0.029144	0.705268
Betweenness Cent.	0.000000	0.004541

Table C13

Toronto ON Data Metric Results

	Bibliographic Network 1975	Social Network 1975
Degree	12	4
Weighted Degree	13	4
Eccentricity	7.000000	3.000000
Closeness Cent.	0.304536	0.500000
Eigenvector Cent.	0.411103	0.006651
Betweenness Cent.	0.180129	0.000660

Table C14

Vancouver BC Data Metric Results

	Bibliographic Network 1975	Social Network 1975
Degree	3	1
Weighted Degree	3	1
Eccentricity	10.000000	11.000000
Closeness Cent.	0.183594	0.180462
Eigenvector Cent.	0.059303	0.005370
Betweenness Cent.	0.000015	0.000000

Table C15

Wilfred Watson Data Metric Results

	Bibliographic Network 1975	Social Network 1975
Degree	5	13
Weighted Degree	5	13
Eccentricity	9.000000	13.000000
Closeness Cent.	0.197479	0.160600
Eigenvector Cent.	0.088060	0.642837
Betweenness Cent.	0.025046	0.000000

Appendix D

Supplementary Network Data

Metric Results: *A Literary Social Network of Alberta, 1975, Robert Kroetsch Included*

The literary social network depicted in Figure 6 (page 57) contains 453 nodes and 900 edges. The average degree is 3.974, while the average weighted degree is 4.455. The diameter of the network is 11, with an average path length of 3.740. The graph density is 0.009. The network has five weakly connected components. When assigned a resolution of 1, the graph modularity is 0.679, and divides into 23 communities, ranging from 2 to 89 members in each. The average clustering coefficient was 0.552. The ten nodes with the greatest betweenness centrality were Robert Kroetsch, Canada Day'75, department meetings in the English department at the University of Alberta, Rudy Wiebe, Douglas Barbour, anonymous21, Max Braithwaite, anonymous68, the Ad Hoc Committee on sessional lectures at the University of Alberta, and anonymous69. The ten nodes with the largest eigenvector centrality were Robert Kroetsch, Canada Day '75, anonymous15, Douglas Barbour, anonymous16, William Spamos, Stephen Scobie, anonymous17, interdepartmental correspondence at the University of Alberta, and C.J. Bullock. The largest closeness centrality is held by Robert Kroetsch. Finally, the ten nodes with the largest authority and hub scores were anonymous15, Douglas Barbour, anonymous16, Stephen Scobie, anonymous17, interdepartmental correspondence at the University of Alberta, anonymous18, anonymous19, anonymous20, and anonymous70.