

Citation Network Analysis in Anthropology

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Introduction

Anthropology has theoretical subcategories that focus on small focus areas within the discipline. Analysis of a citation network will allow the measurement of size and scope of aforementioned paradigms.

Intermediary methods

The use of a PDF reading library allows for the easy reading of documents from the test data from the Alaska Journal of Anthropology. For this project the use of PDFbox in conjunction with some string matching allows the creation of node pairings in the standard input convention for Gephi the graph analysis and visualization software of choice.

INUUVIALUIT RISING: THE EVOLUTION OF INUVIALUIT IDENTITY IN THE MODERN ERA
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ABSTRACT
The Inuvialuit of the western Canadian Arctic were recognized by the government of Canada as the traditional owners and formal stewards of their territory by the Inuvialuit Final Agreement of 1984. During the pursuit of this claim, its proponents replaced the Western term 'Mackenzie Inuit' with the Inuvialuit term 'Inuvialuit' as the collective identifier of the seven or eight traditional groups of the Mackenzie/Beaufort region. The relationships between these groups, and their notions of collectivity, have a rich and complex history. This paper traces the evolution of Inuvialuit social and cultural identity from precontact times through the modern era. The primary focus, however, is on the forces and influences that have helped to shape contemporary Inuvialuit culture, society, and identity in the twentieth century.

KEYWORDS: Inuvialuit, identity, community-based research, land claims, Mackenzie River

The Inuvialuit are the Inuit of the western Canadian Arctic. They have lived along the lower reaches of the Mackenzie River and adjacent coastlines bordering the Beaufort Sea for much longer than recorded in historical documents or oral history. Their ownership and stewardship of this territory was formally recognized by the government of Canada in the Inuvialuit Final Agreement of 1984. The term 'Inuvialuit' only came into widespread use during preparations for the land claim, when it became the collective signifier for the regional groups that historically occupied the lower delta/Beaufort region and who were documented by Europeans in the contact era. Inuvialuit means 'the real people' (Inuvialuit Regional Corporation n.d.). Since the signing of the claim, Inuvialuit have represented themselves to the outside world by their chosen name and as a distinct group with their own languages, cultures, lands and resources (Fig. 1). They have increasingly articulated their own specific histories and cultural patterns and have begun to share these with the outside world. The present paper asks how Inuvialuit identities have evolved in the modern era. In particular, I am interested

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who have entered their territory and asserted claims to it. In the face of this onslaught, Inuvialuit have perpetually sought to define, assert, and renew their identity. Today, Inuvialuit identity is perhaps more concrete, multifaceted, and evolving than ever before. In the present environment of cultural renewal, Inuvialuit are increasingly representing themselves as a distinctive collectivity to the outside world. They are producing works in print, video, art, and other media. They are also spearheading complex political, social and economic agendas and initiatives. Through these activities, Inuvialuit join other circumpolar peoples in their quest to define their difference from other Inuit and northern indigenous groups and from the broader Euro-Canadian populace. Inuvialuit today are asserting their right to articulate and share their distinctive histories, cultures, and languages in ways and on terms of their own choosing.

ACKNOWLEDGMENTS

This paper grew out of conversations with many Inuvialuit about the current state and evolution of their culture and society. I thank my many Inuvialuit collaborators who have such deep, clear, and detailed knowledge of their history and identity. I am particularly grateful to Cathy Cockney, Bridget Lanoque, and Les Carpenter who helped to foster and encourage different aspects of this project. I thank Matt Betts, Elizabeth Linn, and Kabia Saperstein for recommending relevant ideas and literature. The set of interviews that form the basis of this paper were conducted as part of my dissertation research, under the auspices of SSHRC funding. I thank Dina Kosonko for her interest in and arrangement of ArcticNet funding for a portion of the research presented here. I also thank Ernest Burch, the volume's editor, and an anonymous reviewer, whose thorough and insightful comments improved the scope and character of the final paper. I, alone, however, am responsible for any errors or omissions.

REFERENCES CITED

Alkis, Marje
1990 The Finnish Perspective: Language and Ethnicity in the Mackenzie Delta Region. Unpublished Ph.D. dissertation, University of Toronto, Toronto.
2005 Seven Focal Economies for Six Focal Places: The Development of Economic Diversity in the Canadian Western Arctic. *Arctic Anthropology* 42(1):47-87.
2007 Chronology Hunter/Gatherer Ethnography: Economy and Identity in the Western Canadian Arctic. Paper presented at the annual meeting of the Canadian Archaeological Association, St. John's, Newfoundland.
Bockheim, John R.
1986 *Whales, Ice, and Men: The History of Whaling in the Western Arctic*. University of Washington Press in association with New Bedford Whaling Museum, Seattle.
Bodenheim, Barbara
2003 Fall Whaling in Barrow Alaska: A Consideration of Strategic Decision-Making. In *Indigenous Ways in the Present: Native Whaling in the Western Arctic*, edited by Alan P. McCartney, pp. 277-306. University of Utah Press, Salt Lake City.

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Using the marked points on the page we can get the author of the document and the year of publication to the static position in all the documents in the set. By the same principle the references cited section is always marked the same and thus all the references follow the same marked pattern for all the target nodes.

Primary Methods

The Search path count methodology works for small graph sizes, but for graphs of significant size it becomes much more time intensive to perform the exhaustive searches. This leads to the need to develop some method of reducing the size of the graph without significantly changing its shape or the density of the clusters therein. This was accomplished to the best of my ability in the combination of sampling and edge contraction. By taking a significant sample of the original graph separated by degree and then merging said nodes with the ones next to it should shrink the graph with minimal impact on the overall shape.

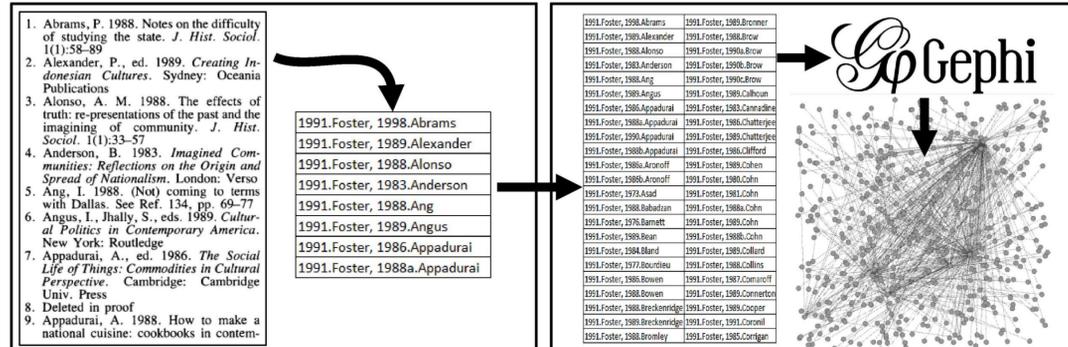


Figure 1 – Citations are removed from their source, either individual articles pdfs or academic internet databases, and the year and name of the head author are removed and formatted in a spreadsheet that can be input into network software.

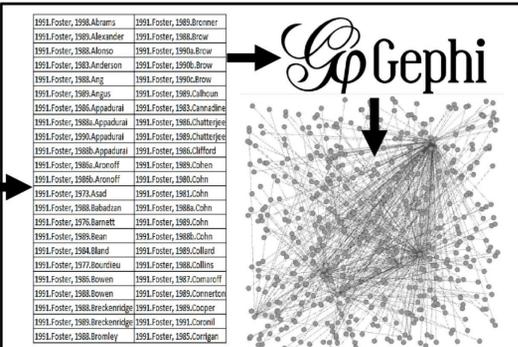


Figure 2 – The large spreadsheet of citations is then input into a graphical analysis program called Gephi. This example graph was produced using a smaller citation network made up of 522 nodes and 528 edges.

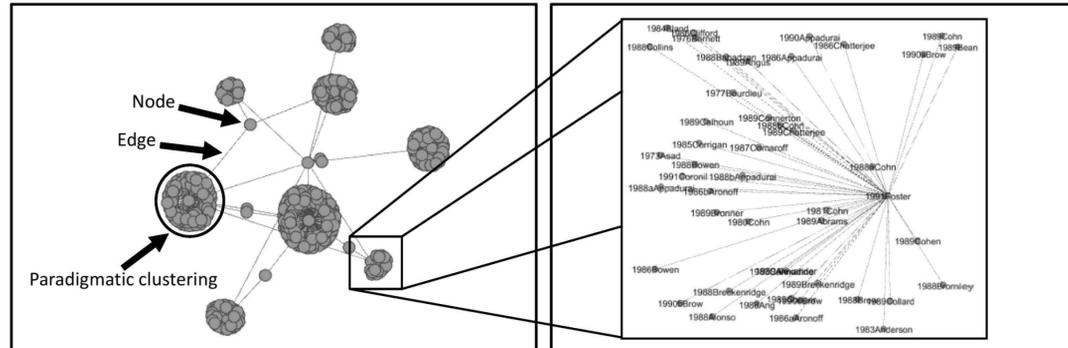


Figure 3 – Algorithms contained within Gephi are run to manipulate the network into a graph that is easier to analyze. The image above is the network after the algorithm has been run. It is assumed that clustering in larger networks will be representative of paradigms.

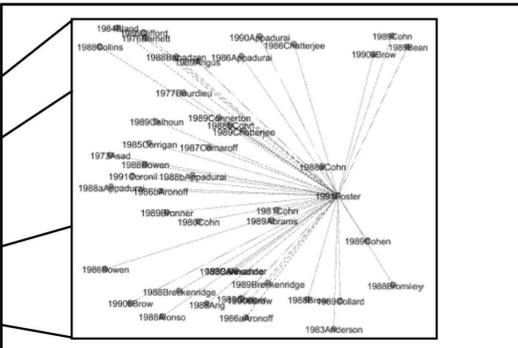


Figure 4 – In this particular cluster we find the citations from the Forster article that was converted in Figure 1 and processed in Figure 2. Because the nodes are individual articles, the connections and clustering will represent closeness to specific ideas in anthropology.

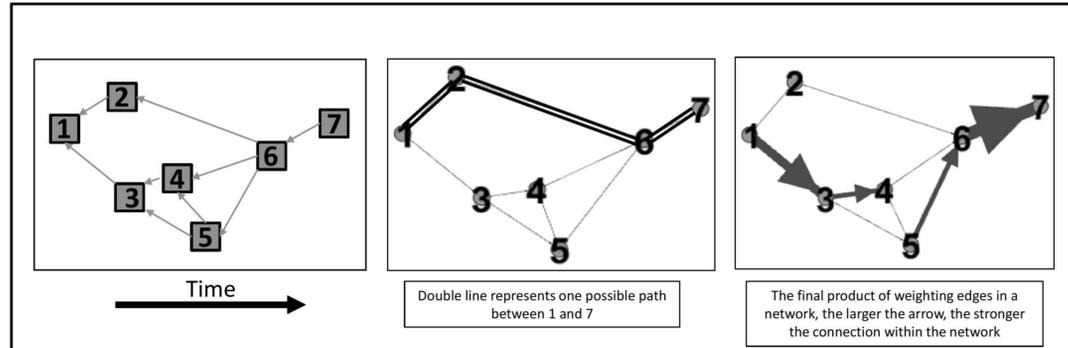


Figure 5 – Due to the immense size of some of the citation networks to be analyzed, some of the nodes are removed to decrease the time required for computation. This is achieved by weighting the edges in the network by measuring the number of possible connections from an input and an output. In this figure, each node represents an academic article, with 7 being the most recent and 1 being the oldest. By analyzing the number of possible paths between 1 and 7 we can give more value, or "weight", to the paths that are able to be used most often.

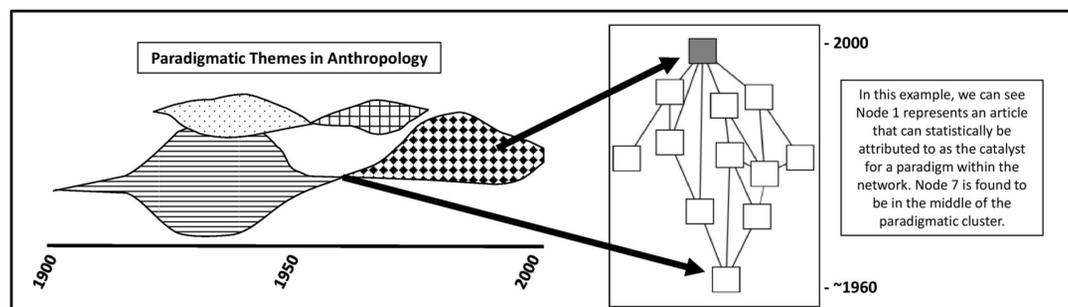


Figure 6 – This graph depicts what a paradigmatic emergence within a citation network looks like when organized temporally by year; the inclusion of the year in the spreadsheet formatting allows for this. By analyzing anthropological theory in this manner, we are afforded a medium to visualize the progression of ideas. The implications of this methodology extend far beyond looking at how or where contemporary theory began, into the realm of forecasting disciplinary trends through mathematical projections based on the data these networks provide.

Goals

As time continues on my partner will use the tools I have made to complete his research on much larger datasets then we have had access to over the course of this semester in doing so he will test the implementations to the limits in his search for new and hidden paradigms in the field of Anthropology.