NEW METHODS FOR THE (LAND)-TAKING: VISUALISING THE NARRATIVE NETWORKS OF THE *STURLUBÓK* REDACTION OF *LANDNÁMABÓK*



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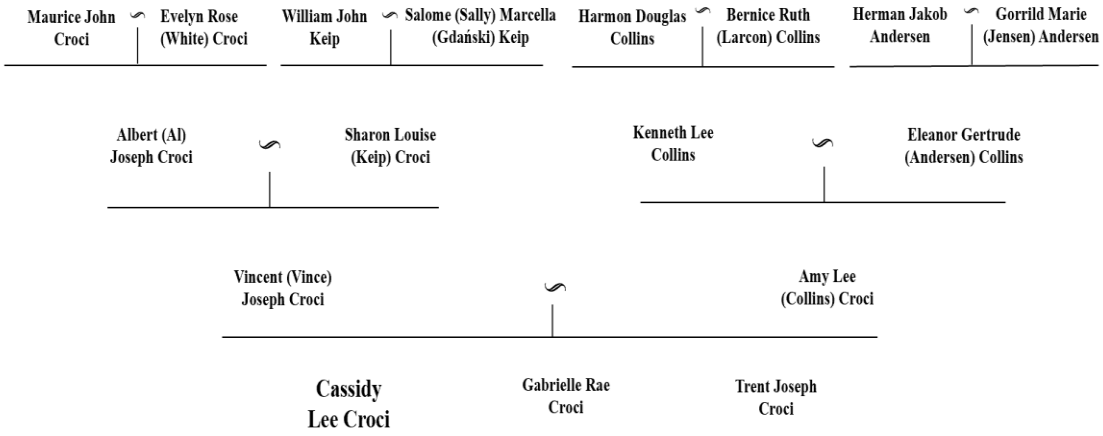
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Abstract

This thesis combines conventional historical and literary methods with Social Network Analysis (SNA) and Visual Analytics (VA) to analyse the *Sturlubók* redaction of *Landnámabók* in an interdisciplinary way. This process facilitates the extraction of the approximately 3,100 individuals and their roughly 8,100 relationships in *Sturlubók* that when combined form the narrative networks (i.e. people and their relationships) of the text. These networks are then visualised and subjected to a large-scale visual and quantitative investigation to detect emerging social and geographical patterns, ultimately providing new insights into how the *landnámsöld* (c.870-930 CE) was remembered in the latter half of thirteenth century (c.1275-1280 CE).

An introductory survey discusses the content, structure, and narrative tradition of *Sturlubók* and situates the thesis in *Landnámabók* scholarship (Chapter 1). In Chapter 2, the interdisciplinary methodological approach is outlined. Chapters 3 to 6 show how the application of SNA can shed new light on traditional approaches and interpretations can be revisited by applying SNA in various ways to *Sturlubók*. The narrative structure of *Sturlubók* is visualised to investigate how regional identities develop during and after the *landnám* (Chapter 3). Next, the question of whether Kolskeggr *vitri*'s influence can be detected in the narrative networks of *Sturlubók* is investigated (Chapter 4). Chapter 5 evaluates whether the different methods of land acquisition used by *landnámsmenn* influence their perceived importance in *Sturlubók*. Finally, Chapter 6, investigates how all 706 women collectively influence and operate in the narrative networks of *Sturlubók*.

It is shown throughout the thesis that narrative networks of *Sturlubók* are complex. They emulate many features found in 'small-world' and 'real-world' social networks: this gives *Sturlubók* its characteristic texture of verisimilitude. These networks are multidimensional, multimodal, and diachronic, crafted and transformed over extensive periods resulting in a text localised to its time that fits paradigms of *landnám* collective memory. Ultimately, this thesis provides a new way to 'read' *Sturlubók* that creates new possibilities for further analysis on account of SNA and VA.



This thesis was generations in the making.

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Abbreviations

Access = Microsoft Access

c.= circa

ch. = chapter

chs = chapters

d. = died

dat. = dative

esp. = especially

Excel = Microsoft Excel

fem. = feminine

gen. = genitive

masc. = masculine

n. = footnote

neut. = neuter

nom. = nominative

ON-I = Old Norse-Icelandic

p. = page

pp. = pages

pl. = plural

sg. = singular

SNA = Social Network Analysis

SQL = Standard Query Language

VA = Visual Analytics / Visual Analysis

List of Landnámabók and Íslendingabók Abbreviations

There are five extant redactions of the work collectively known as *Landnámabók*: *Sturlubók*, *Hauksbók*, *Melabók*, *Þórðarbók*, *Skarðsárbók*. All references to these texts, except for the first time a text is referenced, are by the abbreviation for the text with chapter numbers as given in the normalised edition of *Landnámabók* in ÍF I = *Íslendingabók*. *Landnámabók*, ed. Jakob Benediktsson. Reykjavík: Hið íslenzka fornritafélag, 1968. References to *Íslendingabók* are also taken from ÍF I. Wherever possible all other Old Norse-Icelandic references are to the editions in the ÍF series. These texts are cited with the ÍF abbreviation followed by volume number and chapter number(s). For full list of ÍF texts used see bibliography.

Abbreviation	**Text**
Ldn	*Landnámabók*
S	*Sturlubók*
H	*Hauksbók*
M	*Melabók*
Þ	*Þórðarbók*
Sk	*Skarðsárbók*
Íslb	*Íslendingabók*
ÍF	Íslenzk fornit. Reykjavík: Reykjavík: Hið íslenzka fornritafélag.

Figure 1 List of Landnámabók and Íslendingabók abbreviations

Bibliographical Abbreviations

The following texts are extensively referred to in this thesis, which suggests their abbreviated use. Quotations from them refer to the following editions with page numbers in brackets, with exception to BoI and BoS, which use chapter numbers. Full bibliographic information is listed in the biography.

BoI = trans. Siân Grønlie. 2006.
BoS= trans. Hermann Pálsson and Paul Edwards. 1972.
Grágás = eds. Gunnar Karlsson et al. 1992
JJónGLdn= Jón Jóhannesson. 1941.
ONP = *Ordbog over det norrøne prosaprog.* 1989—. http://onp.ku.dk/
ÓlLárLdnSkag = Ólafur Lárusson. 1940

I Introduction

1.1 Aim of Thesis

When I mention to any Icelander that I study *Landnámabók*, they immediately respond with memories of their family history, ancestral farms, or stories of the past. I have been told by an Icelander that Guðrún Ósvífsdóttir is their great-grandmother—to the twenty-seventh degree.[1] Another informed me that they are a direct descendant of Snorri Sturluson *only* twenty-three generations removed. I have heard countless stories from others of their ancestors' lives on farms in remote areas of the West and East fjords. Such is the grasp genealogy and geography have on the collective memory of the Icelanders; any step in the landscape is also a step into the past.

As an *útlendingur* 'foreigner; alien; expatriate; outlander' (Orðabók Aldamóta, https://snara.is/), it would be easy to dismiss such illustrious claims as unverifiable, but in each lineage or description of the historical topography there are kernels of truth. The grandchild of Guðrún could be from the west of Iceland, or the descendant of Snorri might be able to legitimately trace their lineage to the seventeenth or eighteenth century. Circumstantial evidence could even link the rest of their genealogy to Snorri. Regardless of the actual 'truth', it is important to acknowledge that there is a level of belief in a shared past and modern Icelanders' personal histories—whether sincere or tongue-in-cheek. Where the difficulty lies is in establishing how closely contemporary personal interests map onto the 'real' historical record, and what the best approximation to the truth is.

This, in essence, is the central question of any study on *Ldn* 'The Book of Settlements'. How should a work recounting the *landnámsöld* 'settlement period' c.870-930, that is compiled across several centuries in multiple

[1] This information is from the online genealogical database Íslendingabók, which is available at: https://www.islendingabok.is/.

redactions be used as a historical source? It is worth quoting Jakob Benediktsson (1966-9, 287) on this topic:

> The tradition which was the foundation of *Landnámabók* cannot have been more than an approximation to the truth, and the extent to which it is an approximation is at best difficult and often impossible to assess. This we must put up with, but it is not a reason for giving up the study of *Landnámabók*—it is rather a challenge to go on with it, trying to find new ways of sifting and checking the old evidence.

This PhD project confronts this challenge by employing new methods to *Ldn* to reevaluate the old evidence and reconsider traditional questions e.g. How did Sturla integrate Kolskeggr's contribution in his redaction of *Ldn*? Are settlers invented to fill the landscape? Does gender impact the inclusion of someone in the text?

Applying an interdisciplinary approach combining conventional historical and philological methods with Social Network Analysis (SNA) and Visual Analytics (VA) constructs, visualises, and quantifies the narrative networks of the *Sturlubók* (*S*) redaction of *Ldn.*[2] This process enables the work to be 'read' in new ways by generating network graphs comprised of the approximately 3,100 individuals and their roughly 8,100 relationships documented in *S* (i.e. the narrative networks). Translating 'words into numbers, and then back into words' facilitates the measurement of these relationships, providing *quantitative* analysis from *qualitative* data (Fernández-Aceves 2017, 128). This transliteration shifts the focus from attempting to establish the most accurate approximation of historical 'truth' in *S* to detecting emerging patterns in its narrative networks. Analysing these patterns sheds light on the historical and literary contexts of *S* without automatically making judgements on an element's historicity, ultimately providing a new way to study *Ldn*—the main aim of this thesis.

[2] See 2.1.1 for definition and discussion of narrative networks.

1.2 Structure of Thesis

This introductory chapter provides an overview of the complex origins, textual history, and narrative structure of *S* and discusses why this redaction was selected over the other *Ldn* versions (see 1.3). This information situates the thesis within *Ldn* studies as well as contextualises the results of its case studies.

Chapter II introduces and outlines the interdisciplinary methodological approach in this thesis which combines conventional historical and literary methods with SNA and VA.

To broadly demonstrate some of the potential applications of SNA and VA to *S*, a case study approach has been adopted. Each case study employs different digital humanities techniques to investigate specific questions about how selected individuals and groups (e.g. women, *landnámsmenn* 'settlers') operate within the narrative networks of the text. These inquiries not only provide a better understanding of how individuals are connected to each other in the narrative, but also how *landnám* society was conceptualised by twelfth- and thirteenth-century compilers.

In Chapter III, SNA is applied to the narrative structure of *S* to investigate how regional identities develop during and after the *landnám*. This is achieved by analysing the geo-administrative units known as Quarters (North, East, South, and West), which not only divide the Icelandic landscape, but also partition *S* into regional narrative units. This case study explores whether the Quarters are evolutions of secular structures from the *landnámsöld* or are superimposed by twelfth- and thirteenth-century compilers to reflect their contemporary geo-political boundaries and concerns.

Chapter IV investigates whether Kolskeggr *vitri*'s, an informant for *S*, influence can be detected in the narrative networks of *S*. This case study is integral to understanding whether *Ldn* compilers conceptualised historical individuals and their relationships as part of a continuous,

distributed system or if each constructed their own independent theoretical networks of settlement.

Chapter V evaluates whether the different methods of land acquisition used by *landnámsmenn* (e.g. claiming, purchasing, or being gifted land) contribute to the formation of hierarchical structures in *S.* If so, which methods are the most effective in establishing and consolidating regional power and who are the most (and least) important settlers? Furthermore, do geo-political patterns emerging from the textual networks correspond to what is known about power dynamics in twelfth- and thirteenth-century Iceland, or are they unique to *S*? Analysing these patterns with visual and quantitative metrics provides a better understanding of how Sturla Þórðarson and the other *Ldn* compilers perceived the *landnám*.

The final case study, Chapter VI, is a SNA of the women in *S*. Previous studies of women in *Landnámabók* have either focused on their perceived underenumeration or have discussed the so-called 'exceptional' women like the *landnámskonur* 'female settlers'. Investigating how all 706 women collectively influence and operate in the narrative networks provides for a more comprehensive analysis of gender in *S*. Exploring, in particular whether gender serves as an organising agent of the text or if it impacts the inclusion—or exclusion—of an individual in the narrative sheds light on how women were remembered in medieval Icelandic collective memory.

It is argued throughout this thesis that the narrative networks of *S* demonstrate its 'crafted complexity' (Ranković 2006a, 268). These networks are considered complex from a network-theoretical perspective because they emulate many features found in 'small-world' and 'real-world' social networks which imbue *S* with its characteristic texture of verisimilitude. This complexity is crafted over extensive periods of time through the transmission of historical and mythological information via saga writers/tellers/scribes and their respective audiences (*ibid.*; see also Ranković 2006b). At a particular time during this process, *S* emerged. Therefore, the narrative networks of *S* are not

just temporally localised products curated by Sturla Þórðarson, but they also develop from the collective memory of the *landnámsöld.*

The advantage of using a SNA approach is that the crafted complexity of *S* can be explored without evaluating its historical 'accuracy'. The visualisations and quantifications produced from case studies can be compared to other medieval Icelandic geographical and genealogical constructions to see what memories of settlement are shared without determining what is the more historical interpretation. In turn, elements of *S*'s networks which do not correspond with the conceptual framework established by the network of authorities may represent areas of the text that Sturla Þórðarson manipulated—consciously or unconsciously—to reflect his personal biases and perceptions of contemporary geo-political dynamics.

Ultimately, this thesis embraces the challenge of studying *Ldn* by presenting a new and future possibilities of applying SNA to *S* and other redactions (see VII).

1.3 Landnámabók Texts and Textual Scholarship with Focus on the Sturlubók Redaction

The purpose of this section is to introduce the contents, genesis, textual history, and narrative structure of the *S* redaction of *Ldn*. The networks of *S* cannot be fully explained without briefly discussing the background of the other versions of *Ldn—Hauksbók* (*H*), *Melabók* (*M*), *Þórðarsbók* (*Þ*), and *Skarðarsbók* (*Sk*)—because they all use the same conceptual framework.[3] These textual and organisational elements underpin the compilation of *S*; therefore, they also influence how *S*'s narrative networks are constructed, visualised, and quantified.

1.3.1 Contents of *Landnámabók*

Ldn recounts the *landnámsöld*, traditionally dated c.870-930 CE. The *S* redaction opens with an introductory section which situates Iceland's

[3] *Ldn* is used when texts are referred to collectively.

settlement within the broader European historical context (S1-S2). It also chronicles early expeditions to the island by its first discoverers (S3-S5). Following this prologue, Ingólfr, considered the first permanent settler of Iceland in *S*, is introduced and his settlement narrative is described: *fyrstr landit; gerðu þat aðrir landnámsmenn eptir hans dœmum* (S6-S9). Instead of continuing to list settlers based on their time of arrival and following a more traditional chronological or linear structure, *S* is arranged geographically. Starting at Ingólfr's farmstead in Reykjavík, the land-claims of approximately 425 *landnámsmenn* are enumerated in a clockwise direction around the coast of Iceland before circling back to Ingólfr's claim (see 3.2).

Chapters dedicated to these land-claims are characteristically terse and straightforward. They typically describe how a settler acquired their land, the geographical boundaries of the claim, and are furnished with dense genealogies extending backwards and forwards from the *landnámsöld*. Occasionally these chapters are more descriptive, providing information about settler's origins or listing the exploits of a particular individual.

This laconic, informative style makes *S* the ideal text to conduct SNA. Some 3,100 individuals, details about them (e.g. gender, location), and their relationships can be extracted from the text to construct its narrative networks. Since *S* is the oldest and most complete extant narrative of the *landnámsöld* it is the logical starting point for applying an SNA approach to *Ldn*. Restricting the inquiry to one source presents a synchronic snapshot of how the settlement process of Iceland was perceived at a specific point in time (c.1275-1280) by a particular compiler. There still needs to be an awareness of how the content in the other redactions differs from *S* because they emerge from the same interconnected network of saga tellers/scribes/writers/compilers, therefore, the texts 'speak' to each other. However, the contents of these versions will not be subjected to SNA and will only be discussed if they aid in the interpretation of *S*'s narrative networks.

1.3.2 The Origins of *Landnámabók*

The origins of *Ldn* and its oral prehistory will only be briefly discussed because this study is exclusively concerned with constructing networks from the written text of *S.*[4] Nevertheless, orality particularly in its relationship to genealogy cannot be entirely disregarded because recorded lineages are pulled from a collective framework of ancestral and geographical memory. It is important to note that the aim of this thesis is not to determine which genealogies in *S* are 'correct', but to examine how they combine to form a conceptual network that influences contemporary perceptions of the *landnám.*

1.3.2.a Oral tradition and genealogies: Landnámabók as a genealogical charter

Genealogies are the most fundamental type of oral history. They structure people's perceptions of the past by 'providing individuals with roots, families with group identities, and communities with rationales for continuing alliances or enmities' (Whaley 2000, 190). This knowledge of origins and descent is not relayed through strict historical chronologies, instead it is stored in transgenerational *memory* and accessed via 'an internal network of connections to a past with which older generations are familiar' (Úlfar Bragason 2018, 744-5; see also Gísli Sigurðsson 2004).[5]

In oral formats genealogies, settlement narratives, and other anecdotes function as immanent or potential entities of a collectively envisaged whole (Clover 1986, 34). These fragments of collective memory existed without an ordered structure and would have been recalled and reconfigured in a manner to meet contemporary circumstances. In turn these circumstances would have affected the views

> of the community's past so strongly, that the stories of a succeeding generation might retain little but some of the names and places. Events might move from one generation to another, remembered as happening

[4] For a detailed overview on oral and literate paradigms and the process of textualization in medieval Iceland see Gísli Sigurðsson (2004) and Lethbridge (2007, 5-13).
[5] See Úlfar Bragason (2018, 744) for definitions of ON-I terms used for genealogies like *ætt* 'family, kindred, pedigree'.

> before or after another story, or be associated with one farm rather than a neighbouring one, according to current circumstances.
>
> (Callow 2006, 303)

This process results in the structural form of a lineage being modelled on the form of contemporary relationships (Bohannan 1952, 312; Callow 2006, 301-3). For instance, if two subgroups within a society are having a dispute, genealogies might be retold in a manner where more genealogical distance is placed between ancestors from each of the subgroups. On the other hand, if an alliance is formed between two subgroups, their lineages could be reconfigured to show that they maintained strong connections over time. In this way genealogies function as 'genealogical charters' providing a mental framework in which narratives and chronicles can be constructed (Bohannan 1952; Callow 2006, esp. 302-6, 322-4; 2020, esp. 147-204).

Over time, this unwritten lore coalesces with written sources. Narratives are assembled and sequenced as they are committed to create a new piece of writing. In this way the imminent whole takes on a concrete shape (Clover 1986, 35). However, a work is never 'fully realized' because oral and literary traditions feed back into each other; the 'oral' does not simply end when the 'literary' begins (Ranković 2013). Rather, *S* and the other redactions emerge from a complex system where

> none of its elements (… saga writers/tellers/scribes and their respective audiences) is fully aware of the whole, and that, however creative, however, ingenious, the contribution of each element is also always local: no one holds the strings of the whole system (i.e. tradition in general, and any saga/epic poem in particular).
>
> Ranković (2006a, 268)

Thus, *S* exists in a paradoxical state. It is not just a temporally localised product compiled by Sturla Þórðarson, but it is also a materialisation of a system comprised of interconnected texts and a network of contributors who interact at a particular time and over long periods (Ranković 2006a).[6]

[6] Compiler is used instead of author throughout the thesis because the term author suggests an individual creating an original work, whereas compilers transform existing works. Since *Ldn* was the byproduct of several individuals over several centuries, 'compiler' is apt.

In this iterative transmission process personal names and place-names serve as mnemonic anchors which are imbued with 'kernels' of knowledge—births, marriages, deaths, farm history, conflicts, journeys, and other anecdotes (Perkins 1989; Clunies Ross 1993, 377).[7]

According to the 'genealogical charter' of the time, kernels could be rearranged and attached to different names to fulfil a particular contemporary need (Callow 2006, 303). In the hands of a capable compiler, genealogies were not only an expression of learning, but they could be weaponized for political use or function as legal titles to land (Dumville 1977, 84). Therefore, the portrayal of specific individuals at particular locations in Old Norse-Icelandic (ON-I) works not only reflects historical knowledge, but also contemporary geo-political perceptions of a group and/or location. The act of imposing contemporary concerns on the past imbues a sense of complexity into all redactions of *Ldn*, giving the texts their realistic texture as the society described in them emulates 'small-world' and 'real-world' networks (see 6.4).

In this thesis, *S* is viewed as a 'genealogical charter' comprised of multiple genealogies which each provide a framework to build and arrange individual settlement narratives around (Callow 2006; 2020, esp. 147-54).[8] Sequenced together, the genealogical charters create a cohesive *landnám* narrative which remembers the past in a way that fits the contemporary situation. It is assumed that most of the genealogical charters in *S* predate the *Íslendingasögur* 'sagas of the Icelanders'.[9] Therefore, a perspective can be gained into how medieval Icelanders perceived their past before c.1150—even if this conceptualisation of the past is not historically 'accurate' (Callow 2020, 147, 153). It is important to be aware that not all genealogical charters that

[7] See Perkins (1989) on 'kernels' of oral history in writing.
[8] For an example of genealogical charters at work in ON-I sources see Callow (2006). He compared socio-political affiliations in the mid-west of Iceland as expressed in genealogies of *Laxdæla saga* (taking place from the *landnám* to Snorri *goði* in the eleventh century) with lineages in the *samtíðarsögur* 'contemporary sagas' (c.1117-21). He found that there was 'relatively little in common' between the political situation depicted in each of the sources indicating that perceptions and descriptions of historical relationships changed over time in the ON-I corpus.
[9] Adolf Friðriksson and Orri Vésteinsson (2003, 144) note that 'at some point before the Sagas of Icelanders were written, a concentrated effort was made to record information on all settlements of Iceland'.

underpin *S* have origins in the *landnám*, but the text also includes multiple charters up to its time of compilation. Thus, genealogies in *S* are considered part of a wider distributed network which transcends temporal boundaries and space.

Instead of aligning genealogies, with their 'correct' chronology, which is difficult, if not impossible, this thesis' SNA approach enables the visualisation and quantification of a singular interpretation of medieval Icelandic genealogies at a particular point in time. In other words, this thesis explores the narrative networks of *S* to see how they combine to form a genealogical charter.

1.3.2.b The lost versions of Landnámabók

Styrmisbók is the name given to a lost redaction of *Ldn* attributed to Styrmir Kárason *fróði* (d.1245).[10] It is thought with certainty to be written c.1220; although discussing non-extant texts is by nature speculative (ÍF I civ-cv; Jakob Benediktsson 1966-9, 277). Nevertheless, *Styrmisbók* is confidently considered as the main source for both *S* and *M* (JJóhGLdn 137-74; Jakob Benediktsson 1966-9, 277-8). This inference is largely derived from the epilogue of *H*, where the compiler Haukr Erlendsson states:

> *En þessa bók ritaða <ek>, Haukr Erlendsson, eptir þeiri bók, sem ritat hafði herra Sturla lǫgmaðr, hinn fróðasti maðr, ok eptir þeiri bók annarri, er ritat hafði Styrmir hinn fróði.*
>
> (H354)

> But I, Haukur Erlendsson, wrote this book [*Hauksbók*], following the book which was written by the lawman Sturla Þórðarson, a most learned man, and also that other book, written by Styrmir the Wise.
>
> (trans. Jakob Benediktsson 1966-9, 277)

In addition to *Styrmisbók*, circumstantial and textual evidence suggest that there is at least some form of an even earlier lost version.[11]

---

[10] See Jesch (1984, 10-4) for the definition and discussion of lost literature.
[11] The first lost version of *Ldn* is often referred to as *Frum-landnáma* or *Frumlandnáma* (JJónGLdn 206-7). See ÍF cvi-cxx for more on *Frum-landnáma* and the origins of settlement writing in Iceland.

As with oral tradition, written versions of *Ldn* do not independently emerge as original works. It would have been 'next to impossible' for a compiler in the thirteenth century like Styrmir to collect such a detailed body of tradition about land claims almost three hundred years after the events occurred (Jakob Benediktsson 1966-9, 280; see also ÍF I civ-cv). Furthermore, the topographical accuracy of individual *landnám* narratives indicate that *Ldn* was not a 'nationwide project at first but had rather a regional ambition' (Wamhoff 2018, 756-7). *S* and the other redactions can be therefore viewed as a 'gradual accumulation of oral and written traditions' collated by individuals with specific local knowledge (Jesch 2022, 114).

These collaborative origins are directly referenced in *Ldn*, particularly in the postscript of *H* where Haukr Erlendsson states: *Nú er yfir farit um landnám þau, er verit hafa á Íslandi, eptir því sem fróðir menn hafa skrifat, fyrst Ari prestr hinn fróði Þorgilsson ok Kolskeggr hinn vitri*, 'Now the account of the settlements is completed, which took place in Iceland, according to what the wise men have written, first the priest Ari Þorgilsson the learned, and Kolskeggr the wise' (H354). It is important to mention that Ari *fróði* (1067-1148) is not referenced directly as a source in *S*. However, his *Íslendingabók* 'Book of the Icelanders' (*Íslb*) is interpolated throughout, suggesting that Sturla was influenced by Ari's works.[12] When Ari would have worked on *Ldn* is uncertain, but it is estimated to be in the period between c.1097, when the tithe system was adopted in Iceland, and c.1125 when he wrote *Íslb* (ÍF I cvi-cx; BoS iii). Regardless of the date of authorship, there is strong proof to suggest that he worked on an antecedent *Ldn*, either a continuous version or a collection of regional genealogies (Björn M. Ólsen 1889, 214-20; Barði Guðmundsson 1938; JJónGLdn 203-21; ÍF I cix-cx; Clunies Ross 1993, 376; Callow 2020, 155-6).[13]

Ari's version of *Ldn* likely emerged from his discarded writings (Callow 2020, 156). In the prologue to *Íslb*, Ari states that he was asked to omit

[12] Ari is directly referenced in H78, *Svá segir Ari Þorgilsson*, 'so said Ari Þorgilsson', but not in *S*. This quote is not considered strong evidence to suggest Ari's involvement in *Ldn* because this chapter discusses the settlement of Greenland.
[13] For connections between *Laxdæla saga*, where Ari was an authority, and *Ldn* see (ÍF I cx-cxii; Jakob Benediktsson 1966-9, 281).

sections by bishops on both genealogies and regnal years of kings, *þá skrifaða ek þessa of et sama far, fyr útan áttartǫlu ok konung ævi* (ÍF I viii-xvii; *Íslb* Prologus).[14] These omissions do not mean *Íslb* was bereft of genealogies, rather his keenness for ancestry shines through in the *Ættartala* 'kindred, pedigrees' section of *Íslb*, which traces the lineages of four bishops and his own *langfeðgatal* 'patrilineal line' of almost thirty generations, although he generally only includes one male per generation (Callow 2020, 155; see also Úlfar Bragason 1993, 27-9). Although it is unknown what Ari's actual contribution to *Ldn* was, it is reasonable to assume that he or one of his contemporaries was responsible for the first version of *Ldn.*

Although there is strong circumstantial evidence to indicate Ari influenced the compilation of *S*, 'it seems beyond doubt that his elder contemporary, Kolskeggr Ásbjarnarson' compiled or dictated the *landnám* narratives of the eastern seaboard (Jakob Benediktsson 1966-9, 281; Adolf Friðriksson and Orri Vésteinsson 2003, 144). Kolskeggr's contribution will be introduced later in the thesis because it is a subject of an SNA case study (see IV).

1.3.2.c External influences on the compilation of Landnámabók

In S1, there is a reference to *Aldarfarsbók* 'Book of the Ages' attributed to the venerable Bede. It is unclear if Sturla is referencing Bede's *De temporibus* (c.703) or *De temporum ratione* (c.725) because both mention Thule, which is thought to be the name used for Iceland in the medieval period (S1n1; BoS 1n1). This chapter also references the *Papar* 'Irish priests' who left behind *bækr írskar, bjǫllur ok baglar ok enn fleiri hlutir*, 'Irish books, bells, croziers and lots of other things'. Even though there is an awareness of the existence of Irish books it is ultimately unclear the amount of influence foreign sources had on the compilation of *S* and other redactions (S1n1). Therefore, this thesis will focus solely on indigenous sources unless stated otherwise.

[14] The wording is ambiguous as to whether Ari omitted the genealogies, or they existed as independent sections. Both possibilities have been suggested (Mundal 1984; BoI xi-xii, p. 3)

There are two scholarly works of genealogy mentioned in *Ldn* that are not attributed to Ari or Kolskeggr. The first being *Breiðfirðinga kynslóð* 'genealogies of the Breiðafjǫrðr people' ascribed to a Prior Brandr in H81, *Brandr príor hinn fróði, er mest hefir skrifat Breiðfirðinga kynslóð* 'Prior Brandr *hinn fróði*, who wrote most of the genealogies of the Breiðafjǫrðr people'.[15] In *S* there is a direct reference to *Ǫlfusingakyn* 'genealogies of the Ǫlfus people', *þat segir í Ǫlfusingakyni* 'That is stated in the genealogies of the Ǫlfus people' (S334, S334n3). The written development of these genealogies presumably derived from orally transmitted lineages, which were occasionally furnished with narratives. These are seen at 'different stages of development and elaboration' in *Ldn* and there were probably more written genealogies that influenced the text than are mentioned (Clunies Ross 1993, 376).

In addition to oral and written genealogical lore, extant and lost sagas are also interpolated throughout *Ldn*, particularly in the cases of *S* and *H*. Jón Jóhannesson identified roughly thirty sagas potentially used as sources for *S* (JJóhGLdn 75-136; ÍF I lviii-lxxv). However, it is not the aim of this thesis to establish what sagas have been used as sources in *S* because this has been discussed at length.[16] Therefore, sagas and other external sources will only be mentioned if they aid in interpreting patterns and metrics derived from SNA. Nevertheless, it is important to recognise that these external genealogies and sagas contribute to *S* acting as a genealogical charter and that they impact the formation of its narrative network at some level. But the present focus of this thesis is interpreting how these relationships in *S* function, not determining their exact origins.

[15] None of Prior Brandr's other works survive (JJóhGLdn 192-4; H81n6).
[16] For more on the relationship between *Ldn* and the development of saga writing see Clover (1982, 150-3); Meulengracht Sørensen (1993, 92-4); and Clunies Ross (1993). For interpolations by Sturla Þórðarson see Jesch (1984, 36-40, 51-2). Jón Jóhannesson and Jakob Benediktsson have already discussed the connections between the sagas and *S* at length in their scholarship.

1.3.3 The Transmission and Manuscript Tradition of *Landnámabók*

The interrelationships between the five redactions of *Ldn*, its postulated 'lost' versions, and other ON-I textual influences are complex and have been discussed at length by other scholars (Björn M. Ólsen 1904; 1905a; 1905b; 1908; 1910; 1920; JJóhGLdn; ÍF I l-cliv; Jakob Benediktsson 1966-9; Sveinbjörn Rafnsson 1974; 2001; Jesch 1984; Gunnar Karlsson 2016). Therefore, only a summary of the relationships between *Ldn*'s lost redactions and extant manuscripts is provided.

1.3.3.a Defining the terms 'redaction' and 'copy'

Ldn survives in copies of five extant redactions, three medieval (*S, H, M*) and two early modern (*Sk, Þ*). These versions are in various states of preservation with some surviving in whole and others in part. Most discussions regarding the transmission of *Ldn* also include two 'lost' versions of the text, a supposed original by Ari Þorgilsson and *Styrmisbók* (see above). In this thesis, Jesch's (1984, 11) definitions for 'copy' and 'redaction' are used.[17] A copy is a realisation of a literary work where a scribe copies an original text. This process produces inexactitudes and imperfections of minor significance, 'consisting mainly of misspellings, omissions, replacements of words or names by similar-sounding or looking ones'. These small, unintended differences have little or no influence on the work, therefore, these new realisations are considered copies.

A 'redaction' is a new realisation of a work that includes 'conscious and intended changes [alteration, addition, or subtraction], which moreover extend over whole sections of the work, rather than just being certain details' (ibid.). Nevertheless, a redaction is still recognisably a realisation of the original work. Since the different versions of *Ldn* all share a common core but are altered

[17] Henceforth, redaction and version are used interchangeably.

enough to be considered distinct realisations, they are redactions (JJóhGLdn 8).[18]

1.3.3.b Relationships between Landnámabók redactions

Figure 2 is the generally accepted stemma of *Ldn* put forward by JJóhGLdn.[19] The logical place to begin when discussing the stemma is at the second lost redaction, *Styrmisbók*, which is older than all extant texts. Jón Jóhannesson argued that much of *M* was direct copy of *Styrmisbók* with very few alterations or changes (JJóhGLdn 140-74).[20] Additionally, *M* is believed to preserve the original composition of *Ldn* marked by the continuous arrangement of Quarters, the system of geographical division used in medieval Iceland (Sveinbjörn Rafnsson 2017, 50; see 3.2).[21] The relationship between *M* and *Styrmisbók* is shown on the right-side of the stemma.

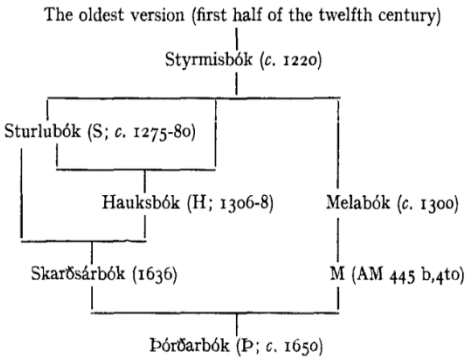


Figure 2 Stemma of Landnámabók (Jakob Benediktsson 1966-9, 276)

S is also derived from *Styrmisbók* but is considered an expanded and revised version. The relationship between these two versions is shown on the left-side of the stemma. The most notable difference between *S* and *M* (and presumably *Styrmisbók*) is that *S* does not start with the enumeration of

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[18] '*Munurinn á þremur aðalgerðunum, Stb., Hb. og Mb., er svo mikill, að þær má í raun og veru telja þrjú rit, sem öll eiga rétt á að heita Landnámabók. Stofninn í þeim er að miklu leyti sameiginlegur, og einhver hluti hans a.m.k. er vafalaust skásettur á fyrra hluta 12. aldar'* (JJóhGLdn 8).

[19] Sveinbjörn Rafnsson (1974, 68-84) complicated this stemma by arguing that *Styrmisbók* was not the main source for *S*. Instead, he argued that they both share a common source that he calls +X. His theory does not largely deviate from JJóhGLdn's, therefore, JJóhGLdn's stemma is used for the sake of simplicity.

[20] There are some recognisable differences between *M* and *Styrmisbók*, notably *M*'s more singular interest in tracing the history of the Melamenn (Callow 2020, 155n19).

[21] Chapters M1-M14 correspond to S336-S343, S345-S350; and M15-M48 with S76-S86, S99-S100, S111-S113, S115-S119, S122-S135. For more on the difference between *S* and *M* see ÍF I (lxxxii-lxxxiii).

settlements in the southeastern part of the Southern Quarter like *M.* Instead, *S* is rearranged to open with Ingólfr's settlement further up the coastline at Reykjavík (see 3.2). Again, this reorientation of land-claims is not enough of a drastic change for *S* to be considered a complete re-writing or new realisation because the descriptions of the land-claims for the most part retain their original narratives with the occasional elaboration by Sturla.[22] Thus, what *S* borrows from *Styrmisbók* can be determined through comparison to *M* (Jesch 1984, 64).

In turn, *H* uses both *Styrmisbók* and *S* as its sources, with *S* and *H* being identical for the most part. This explains why the standard ÍF edition uses *S* as its base text and gives little space to compare it with *H* as the secondary text (Callow 2020, 156). The few discrepancies between the two versions can be used to uncover some of the information in *Styrmisbók* not in *S,* but this method is not entirely reliable because there are also independent additions to *H* by Haukr including his own genealogy (JJóhGLdn 51-2).

The youngest redactions, *Sk* and *Þ*, are useful for textual comparison with copies of the older version to provide information on what is lost. *Sk* is a compilation of two vellum manuscripts containing *S* and *H* and can be used to control the readings against Jón Erlendsson's copies of these respective texts.[23] *Þ* is a compilation of *Sk* and *M. Þ* is particularly important because it uses the same manuscript of *M* at a time it was more complete. At present there are only two surviving leaves of the *M* redaction. Therefore, everything in *Þ* not from *Sk* is assumed to derive from the lost sections of *M*, providing a more complete picture of this text. Since *M* is considered the oldest version of *Ldn,* it can be used as a basis for comparison to determine what additions were made in the other texts, specifically *S* (Jakob Benediktsson 1966-9, 278; Jesch 1984, 64).

[22] Sveinbjörn Rafnsson (2001; 2017) views Sturla as more interventionist than the consensus.
[23] Jón Erlendsson's copies are considered reliable sources because there are only minor flaws in his reproductions (JJóhGLdn 10-1). Occasionally, he will omit words or have a gap in his information, but these errors could be explained as simple mistakes made when copying. Alternatively, these omissions could have already been present in the versions of *Ldn* he was copying from (ibid.).

1.3.3.c Manuscript history of individual Landnámabók redactions

The main manuscript information of each extant redaction is summarised in Figure 3 and discussed in the following sections.

Manuscript	Redaction	Foliation	Date of original work	Date of extant manuscript	Compiler
AM 107 fol.	*Sturlubók*	1r-76r	c.1275-1280	1640-1660	Sturla Þórðarson (d.1284)
AM 371, 4to	*Hauksbók*	1r-14v	c.1306-1308	1302-1310	Haukr Erlendsson (d.1334)
AM 445 b, 4to	*Melabók*	1va-2v	c.1275-1313	1390-1425	Snorri Markússon (d.1313)
AM 104 fol.	*Skarðsárbók*	1r-99r	1636	1690-1697	Björn Jónsson *á Skarðsá* (d.1665)
AM 106 and 112 fol.	*Þórðarbók*	1r-35v; 1r-11v	c.1650	1644-1651; 1600-1700	Þórður Jónsson (d.1670)

Figure 3 Summary of manuscript information of all extant redactions of Landnámabók

1.3.3.c.i *Sturlubók*, AM 107 fol.

S is the redaction used in this thesis because it is the earliest extant full version of *Ldn.* It was originally compiled at some point during Sturla Þórðarson's life (1214-1284). It is difficult to pinpoint exactly when he compiled the manuscript. However, it is believed that he assembled *S* towards his death because considerable attention to detail is given to land-claims in the Western and Northern Quarters where he served as *lǫgmaðr* 'law-man' from 1272-1282 (Sveinbjörn Rafnsson 2017, 48).

There is a witness to Sturla's version through *H* (H354; Sveinbjörn Rafnsson 1974, 24-6). A complete fourteenth-century manuscript of *S* (*Resenbók*), likely originating in the west of Iceland, survived until the eighteenth century but was burnt in the Copenhagen fire in 1728 (JJónGLdn 10). Fortunately, *será* 'reverend' Jón Erlendsson *í Villingaholt* (d.1672) transcribed the manuscript in the seventeenth century before he left Denmark, and that copy (AM 107 fol.) is now the main source for *S*.

1.3.3.c.ii *Hauksbók*, AM 371 4to

The oldest extant manuscript of *Ldn* is *Hauksbók* (AM 371 4to) compiled by Haukr Erlendsson (d.1334) in the first years of the fourteenth century. Fourteen leaves of Haukr's autograph copy survive in the manuscript known as *Hauksbók.* Stefán Karlsson compared the handwriting of Haukr's personal letters to *Hauksbók* to give a more concrete date between 1306-1308 (Stefán Karlsson 1964). The nearly complete text of this redaction was also copied by Jón Erlendsson sometime in the seventeenth century (AM. 105 fol.).

1.3.3.c.iii *Melabók*, AM 445 b 4to

Melabók survives only in two vellum leaves (AM 445 b, 4to) of a fifteenth-century copy. The copy is clumsy with the scribe often misreading and miswriting words, especially names, and he often skipped words or lines (JJóhGLdn 11). The leaves are thought to be from a longer narrative manuscript also called *Melabók* or *Gervi-Vatnshyrna* from which leaves survive in AM 162E fol., 445a 4to, 445b 4to, and 564a 4to (Sveinbjörn Rafnsson 2001, 13). However, even from the extant text it is evident that this redaction is different in content and much shorter than the other medieval versions. It is likely that *M* was written sometime between 1275-1313 but is based on an earlier source (Sveinbjörn Rafnsson 1974, 33).

M is often attributed to Snorri Markússon of Melar in Melasveit (d.1313). This is because there are over forty instances in *M* where a genealogy leads to Snorri's parents and/or his wife, even though he is never mentioned (Jakob Benediktsson 1966-9, 277; Sveinbjörn Rafnsson 2017, 49).

1.3.3.c.iv *Skarðsárbók*, AM 104 fol.

Skarðsárbók (AM 104 fol. and other copies) is a paper manuscript from the seventeenth century—before c.1636. It was compiled from the now burnt *S* vellum and autograph vellum of *H* by Björn Jónsson *á Skarðsá*. Björn's original is now lost, but one of the best copies is AM 104 fol. (Sveinbjörn Rafnsson 2001, 13).

1.3.3.c.v *Þórðarbók*, AM 106 and 112 fol.

The text now known as *Þórðarbók* was originally called *Melabók* until the two surviving fragments of *M* were discovered. It is now named after its compiler Þórður Jónsson *í Hítardalur* (d.1670) (JJóhGLdn 19). As shown in Figure 2, *Þ* is clearly a compilation, combining *Sk*, a nearly complete *M*, and its sources are often mentioned in the text i.e. '*Hauksbókar*' and '*Landnámu*' (which can refer to either *S* or *M*), and *Þ* usually agrees with these redactions (JJóhGLdn 19-36).

II Methodology

2.1 Methodological Approach

This thesis investigates the social networks and social structures of *S* using an interdisciplinary approach combining conventional historical and literary techniques, such as contextualising *S* within its historical *milieu* and conducting multiple close readings through the ON-I text*,* with quantitative methods. The latter includes generating simple statistics like counting the number of individuals within the text and identifying the percentage of individuals attributed to certain groups (e.g. women, *landnámsmenn*, and Quarter of origin), together with SNA and VA. This integrated approach moves past the 'loose' and 'metaphorical' sense of networks often employed by historians, to construct and visualise the narrative networks of *S* (Roldán Vera and Schupp 2006, 406; Lemercier 2015, 283; Hillner and MacCarron 2021, 21). However, just producing graphs or visualisations of these networks is not the aim of this thesis because it is not a meaningful endeavour. Rather the objective is to view *S* from a relational perspective to identify emerging social, cultural, and genealogical patterns using these visualisations and quantitative indicators to better understand how these elements influence the structure of text.

Understanding the social networks and social structures of *S* provides insight into 'real-world' social, political, and geographical conditions of both the settlement period and the time of *S*'s compilation.[24] To achieve this goal a balanced approach must be struck between traditional methods and quantitative methods. This balance is achieved via clear research questions and a systematic approach to gathering data (Lemercier 2015, 283-4; see introductions to chapters III, IV, V, and VI for case study questions). It is important to provide a detailed, replicable methodology when using SNA because there 'is not a specific body of [network] theory but a collection of theoretically informed

[24] 'Although designed for "real world" data, SNA methods can be applied to the world of the sagas' (Tangherlini 2015, 151). See also, See MacCarron and Kenna (2013) for discussion on comparing statistical properties of networks of the *Íslendingasögur* to other mythological and 'real-world' networks.

methods' which can in principle be applied to any object using SNA (Kilduff and Tsai 2003, 35-65; Scott 2017, 6-9). Furthermore, a pre-established SNA approach will not consider the intricacies of *S.* Therefore, a new model which accounts for the unique literary and historical context of the relationships in the text is necessary to properly visualise its social, political, and genealogical networks. This thesis introduces a novel SNA approach based on a shared core of concepts developed by network scholars, historians, and literary scholars which includes a range of social theories, methods, and network trends to be specifically applied to *S*.

2.1.1 The Narrative Networks of *Sturlubók*

Before diving into the specifics of the methodology, the term 'network' must be defined and what constitutes a network in *S* explained. At the most basic level 'a network is nothing more than a set of discrete elements (the vertices [nodes]), and a set of connections (the edges) that link the element typically in a pairwise fashion' (Newman et al. 2006, 2). Here the approximately 3,100 individuals recorded in *S* are conceptualised as the elements connected by their relationships and affiliations (see 2.3, 2.4, 2.6.1.a and 2.6.1.b). When individuals and their relationships are combined, they comprise the social networks of *S*. These networks are considered 'narrative' or more specifically 'character networks' which are 'graph[s] extracted from a narrative, in which vertices represent characters and edges correspond to interactions between them' (Labatut and Bost 2019, 1).[25] It is important to make this clarification because this thesis is not visualising any social networks from 'real world' medieval Iceland that existed in the past, but only those of the text itself.

Narrative and character networks are often associated with works of fiction, but they have been successfully applied to historical narratives such as *Cogadh Gáedhel re Gallaibh*, *Vita Wilfridi*, and *Historia Ecclesiastica Gentis Anglorum* (Yose et al. 2018; Labatut and Bost 2019, 1, 3; Hillner and MacCarron 2021). Related SNA approaches have been applied to the

[25] Henceforth, the terms 'social network', 'character network', and 'narrative network' are used interchangeably because they are all referring to networks created from *S*. Networks (pl.). is used because multiple visualisations can be generated with SNA to represent different aspects of the text. Network (sg.) is used when a singular network is being discussed.

Íslendingasögur, notably *Egils saga* which are closer in genre to *S* and are also from the ON-I corpus (MacCaron and Kenna 2013; Tangherlini 2015). It is useful to classify *S* as a narrative network because this approach compensates for idiosyncrasies of working with a medieval source such as the under-recording of information and source bias by accepting these elements as features of the network (Hillner and MacCarron 2021, 21). This is particularly important when working with *Ldn* because it cannot be considered a singular text; rather *Ldn* is a 'collective name for a set of texts' (Jesch 1984, 61; see 1.3.2 and 1.3.3). Although the focus is only on the networks of the *S* redaction, there is a general awareness of how the lost versions and five extant redactions are connected because these interrelationships influence how networks of *S* are interpreted. *S* was the redaction selected for this exploratory study because it is the best representative of the earliest reconstructable stage of *Ldn*, therefore, it is the most suitable for SNA analysis.

Conceptualising *S*'s networks as narrative networks allows for questions surrounding the historicity of the individuals referenced in the text and the historiography of the text to be explored after the networks are constructed. These difficult historiographical issues do not need to be addressed during the data collection and network construction stages of the project because all named individuals in *S* are inserted into its overarching narrative network. Whether these characters were 'real' or not is not a concern because if they are recorded in *S*, they are considered part of the conceptual networks of settlement (see 2.3). Nevertheless, analysing an individual's ego-network in the overarching network in *S* to see if their relationships follow 'real-world' patterns could lend legitimacy to some individuals as historical figures (see 5.3.1.c.iii and 6.3.2 esp. pp. 260-2.[26] Furthermore, this methodology accepts that certain individuals like women and enslaved people are under-recorded and that there are gaps in the text from lost information or scribal intervention (Jacobsen 2005; Brink 2021).[27] These individuals are not

[26] An ego-network is a simple social network formed of a given individual, the *ego*, and the other individuals whom they have relationships with, *alters* (Arnaboldi et al. 2016, 27).
[27] Brink (2021, 5-20) argues for a comparative approach to studying slavery in the Viking Age because there is a lack of contemporary written sources in medieval Scandinavia. Jacobsen (2005) examines some of the potential reasons why women are under-recorded in *Ldn*, see 6.1.1 for discussion.

added to *S*'s network even if they are known from other sources because the aim is not to be comprehensive and visualise the entire narrative network of the ON-I corpus. Instead, the goal is to reconstruct meaningful visualisations of the social networks of *S* for an in-depth interdisciplinary analysis of its patterns. Constructing the networks of *S* reinforces results from close readings and philological and historical analysis because all evidence used to create the visualisations is directly taken from the text. This creates an iterative process of reading *Ldn*, entering the data from the text, producing visualisations, examining emerging patterns, and then returning to the text to analyse these phenomena.

Although the networks of *S* are derived from a narrative, it does not mean that they cannot be used as a model to understand the 'real-world' society of medieval Iceland. The social networks of a historical text act as a 'site[s]' where multiple relationships 'cross and collide, inviting us to think in new ways about power' (Levine 2015, 122). Everyone in *S* has their own ego-network which overlaps with others through different types of relationships, including, but not limited to kinship relations, disputes between people, and land transactions. Therefore, there are possibilities of interconnections between enslaved individuals, women, *landnámsmenn*, royalty, and others that might have been overlooked when using more traditional methods. These interactions may represent 'real' social relationships or simply be a feature of the genre, but identification of phenomena is a valuable first step (MacCarron and Kenna 2013). Analysing the nature of these interactions and how they came to fruition reveals social, political, and geographical patterns which may reflect medieval Icelanders' perceptions of the *landnámsöld* and their contemporary society. Moreover, investigating the narrative networks of *S* sheds light on how *S* was compiled to emulate an idealised form of reality.

2.2 Overview of Methodology

The methodology used to construct the network of the *S* redaction of *Ldn* is a multi-part process. The first step is to identify individuals and their relationships in the text which serve as nodes and edges in social network visualisations (see 2.3 and 2.4).[28]

Nodes are the smallest unit of a network and appear as dots on network graphs (de Nooy et al. 2005, 6). Each node has its own unique identification number to signify the individual it represents. P_1 on Figure 4 is an example of a node in a graph with an identification number, here 1. For the visualisations of *S*, the identifying labels are renamed to display the individual's standard name, usually a personal name or nickname, to indicate who is represented by each node (see 2.6.1.a).[29] In some visualisations labels are removed to better see broader network patterns; however, in these instances the labels are still attached to the node in the software, so even if the individual's name is not visualised it is still preserved.

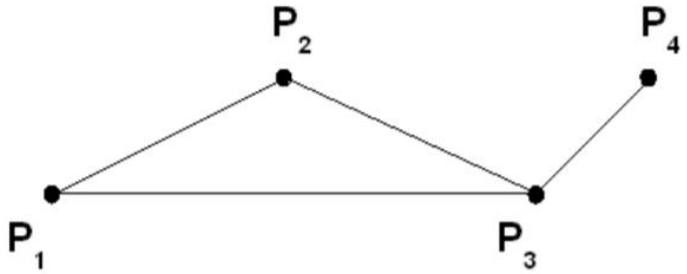


Figure 4 Example of a simple social network (Haggerty and Haggerty 2010)

The next part of the process is to detect and define the relationships that connect the individuals in *S* and record these interactions and affiliations in the database (see 2.4 and 2.5). These relationships are visualised as edges in network graphs and serve as ties between two nodes.[30] Edges look like lines on the graphs and can represent any type of social relation (de Nooy et al. 2005,

[28] Nodes are also referred to as vertices in SNA terminology and will be used interchangeably.
[29] For instance, Grímr Kveld-Úlfsson is assigned the standard name of Skalla-Grímr in the database because he is usually referred to by this name in *S*.
[30] Edges are also known as lines/ties and these terms will be used interchangeably.

6). The social relationships that occur in *S* and comprise this network are defined in 2.5. The line between P_1 and P_2 on Figure 4 is an example of a visualised edge. Each edge/relationship is also categorised by type e.g. consanguineous kinship, affinal kinship, a hostile relationship formed because of a dispute. This process is described in more detail in 2.5.1.

Traditional literary and historical approaches are required to identify and define individuals and relationships. At present, there are technical limitations on automatically detecting and collating ON-I personal and place-names and relating individuals in these texts for SNA. This is partially attributed to the difficulties that computer software has sorting in through nuanced implicit and explicit information found in medieval texts (Yose et al. 2018, 8). It is a feature of the methodology to manually identify individuals and their relationships because it not only incorporates the traditional literary technique of close reading into the approach, but it lends to the creation of a methodology centred exclusively on the individuals and relationships found in *S* (MacCarron and Kenna 2012). In turn, this process of combining traditional and digital approaches has contributed to developing a new way to think about the text in a way previous scholars have not done, as well as raise interesting questions.

Information about individuals, their unique attributes, and relationships in *S* are then entered and stored in a Microsoft Access database (Access) that archives the inputs for SNA and VA. It is important to stress that the database is only a tool used as part of the methodology for storing, preparing, and querying data before it is converted into network graphs; it is not directly involved in the analysis of this data (see 2.6).

The next step is to extract the network graphs from the information stored in the database to visualise and quantify the networks of *S* for analysis (see 2.7). Data from Access is formatted and eventually exported into *Gephi*, an ‘open source software for exploring and manipulating networks’ via Microsoft Excel (Bastian et al. 2009). Using *Gephi* the networks of *S* can be manipulated to visualise different aspects of its composition. For instance, nodes can be recoloured by gender to show where women are in the network

and relationships can be recoloured by type to display how people are connected across the network (see 6.2.1 and 6.5.1). SNA is an iterative and not always linear process; therefore, steps can be applied in different sequences and graphs can be generated at any point in time to investigate emerging patterns and new research questions. Using a combination of quantitative methods and conventional historical and literary techniques, these patterns are analysed and interpreted to help better understand the social, political, and geographical structure of the text.

2.2.1 Visual Analytics

The goal of VA 'is to make our way of processing data and information transparent for an analytic discourse' (Keim et al. 2010, 2). In other words, visualising the data—individuals and their relationships in *S*—takes advantage of 'information overload' by providing a means of examining patterns and processes instead of just producing quantitative results. The heuristic value of this approach is best summarised by one of its founders, Moreno (1934, 103), who observes 'the expression of an individual position [in a social network] can be better visualized through a sociogram than through a sociometric equation'.[31]

Point-and-line charts like social network graphs present information in a 'readable' format which can be interpreted in different ways depending on an individual researcher's expertise (Venturini et al. 2021, 1-2). In this way, VA combines the strength of the human researcher with electronic data processing to find and explain these processes. This has led to some scholars considering VA as an 'unsettled' approach because there is not a systematic way to 'read' these graphs (Venturini et al. 2015, 1). Yet this ambiguity in interpretation provides opportunities to 'see' different patterns and structures based on one's own expertise.

The readings of *S*'s narrative networks presented in this thesis come from a researcher whose academic background is in interpreting ON-I literature

[31] See Venturini et al. (2015) and Freeman (2000; 2009) for more on Moreno formalising VA as an approach.

and is versed in medieval Icelandic and general Viking Age history. This expertise results in identifying patterns during analysis of the networks which correspond to relevant questions in these fields. If an individual from another academic background applied the same method to *S*, their findings will be different because they will interpret the narrative networks based on their own experience. However, this diversity of potential interpretations does not mean that general guidelines for analysing and explaining visualisations of data do not exist.

To articulate visual readings of network graphs at a superficial level to general audiences there are a few theoretical and practical considerations. This thesis follows Venturini et al.'s (2021, 3) methods for conducting VA which are based on three main visual principles:

(1) nodes are positioned according to their connectivity
(2) they are sized proportionally to their importance in the network
(3) and are coloured or shaped by their category. [32]

After these principles have been considered, network graphs can be further interrogated by an expert of the data being visualised and explained to a specialist audience.

2.2.1.a Positioning of nodes

In graphs with 'force-directed layouts', nodes are positioned according to their connectivity (Di Battista et al. 1999; Jacomy et al. 2014). When a force-directed algorithm is applied 'nodes are charged with a repulsive force driving them apart, while edges introduce an attractive force between the nodes they connect' (Venturini et al. 2021, 2-4).[33] In other words, nodes are positioned in the network based on how they repulsed and/or attracted to other nodes. This magnetism creates meaningful dispositions of nodes where individuals who are related—directly or indirectly—appear closer together in visualisations.

[32] See Venturini et al. (2021) for a historical overview of VA and for more examples of how to conduct VA.
[33] Unless otherwise stated, this thesis used the ForceAtlas2 algorithm to generate network graphs in *Gephi* (Jacomy et al. 2014).

Force-directed layouts allow for network graphs to be read like geographical maps. Distances between nodes can be compared to see which relationships might have seemed closer or more distance. The centres and margins of the network can be located, with individuals surrounded by other nodes viewed as important compared to their more isolated counterparts. The density of the network can also be estimated, providing insight into the relative strength and number of relationships.

2.2.1.b Sizing of nodes

Nodes can be sized proportionately based on their importance which is determined using centrality measures—measures which analyse the position and ranking of a node in a network (see 5.5). Looking at sizes of nodes is an intuitive process. Larger nodes typically represent an individual who ranks highly in a specific metric, whereas small nodes usually indicate less important people. For example, in Figure 5, there is a large central orange node surrounded by many smaller nodes. Intuitively, the large, orange node is perceived as the most important node in the graph, even when the centrality measurement dictating the size of the nodes is unknown.

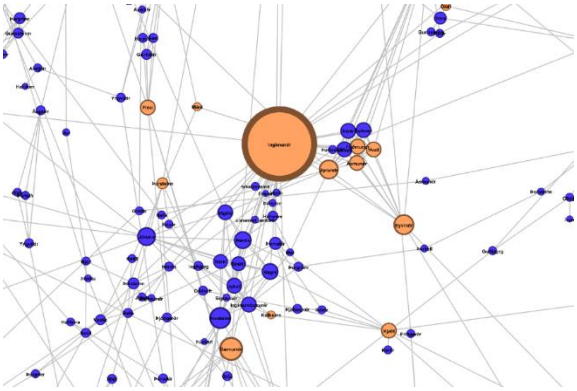


Figure 5 Nodes sized proportionally to their importance

2.2.1.c Colour of nodes

Manipulating the colour and shape of nodes, labels, and edges based on how they are categorised creates *salience*. Salience 'is the physical property that sets an object apart from its surroundings' (Wong 2011, 889). Colour-coding nodes based on the gender, settler-status, or Quarter of reference, etc. helps the viewer perceive, organise, and locate information of interest.

For example, in Figure 6, the nodes of individuals whose names are comprised of one of the following elements: *Finn-, Finni*, *-finnr*, or *-finna* are identified by a label with their name recoloured in blue. Individuals who do not have one of these elements in their name do not have a label and are represented by grey nodes. Colour-coding and labelling—or not labelling— the nodes of individuals in Figure 6 creates a visual distinction between individuals who have a *Finn*-element and those who do not. Identifying areas where *Finn*-names cluster is worth analysing because these names in ON-I sources are often 'directly connected with people of Saami' or Finnish origin (Mundal 1996, 111). Each *Finn*- name cluster could then be analysed to see if it represents a family who uses thematic naming to genealogically preserve some type of connection to Finnish or Saami origins. This would provide insight into how families with non-Scandinavian/British Isle infuse their heritage into their relationships over time.

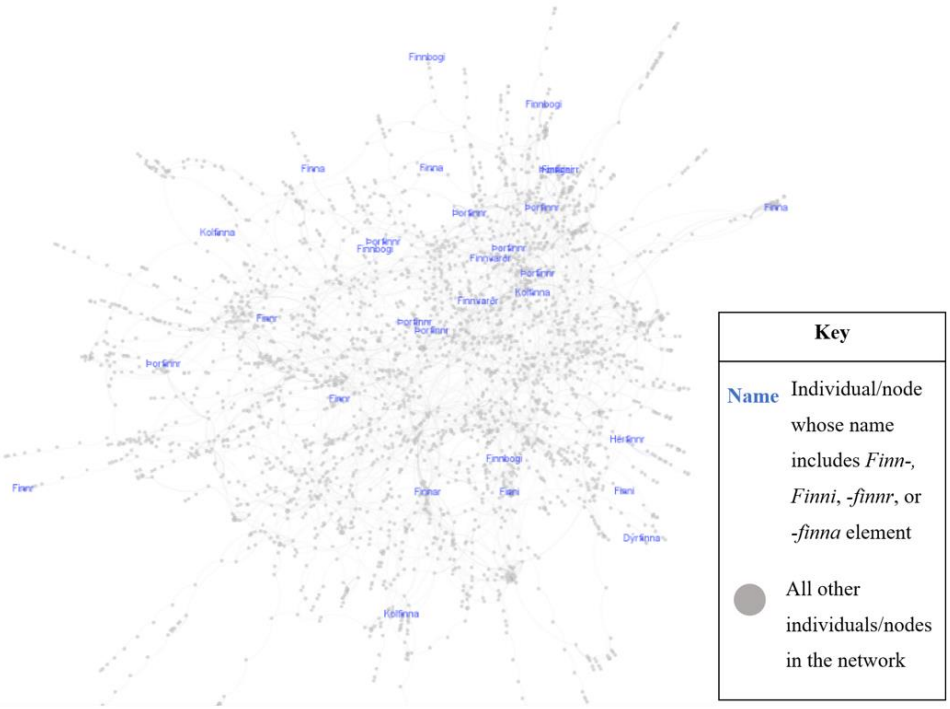


Figure 6 Individuals with Finn-, Finni, -finnr, and compounds with these names

2.3 Identifying Individuals

The debates on the historicity of *S* extend to the individuals recorded within text. However, whether a person was 'real' or created to fill the landscape does not impact on their inclusion in this social network, because this network reflects the composition of the text, not social networks of the 'real world' (see 2.1.1). Therefore, any named person referenced within *S* is considered part of *S*'s narrative networks and they are recorded into the database. The overall patterns from this study can still reflect to some extent 'real' historical, social, or political conditions either of the settlement period or during the time of composition of *S* because its genre, contents, and composition are inseparable from medieval Icelandic society. For instance, the composition of the network could help identify historical figures and constructed people in the network by looking at the number of relationships an individual has. If someone has abnormal social relationships or has no relationships it may indicate that they were artificially placed in the network by the compiler and that individual and their land-claim deserve further analysis (see 5.6).

Individuals are identified in *S* using a manual approach which includes carefully reading the text through with multiple passes to find and collect all their mentions within the material. A manual approach is necessary when identifying individuals because there are currently technical limitations with computers as they cannot sort through implicit and explicit material and automatically extract this complex information in historical and mythological texts (Yose et al. 2018, 8; MacCarron and Kenna 2012). It is a methodological choice because it provides a better 'focus on other steps of the network extraction and/or analysis process' (Agarwal et al. 2012; Labatut and Bost 2019, 7).

A working knowledge of ON-I personal names and bynames is required because they not only identify a person, but also carry cultural and genealogical weight and can provide insight into familial or social relationships (Whaley 1993). Additionally, ON-I is a case inflected language where personal names take on different forms depending on their grammatical function, thus *Ásgeirr* and *Ásgeirs* are the same name, but the latter is gen., whereas the

former is nom. Additionally, several individuals in *S* have the same personal name which makes it necessary to understand the context in which individuals are operating to distinguish one *Þorkell* from the forty-seven other *Þorkell*s. It is also possible for individuals to be referenced under their bynames, a different spelling of their name, or another name altogether. ON-I personal names are also grammatically gendered; therefore, people can be assigned as female or male based on the grammatical gender of their name to further study relationships (see VI). Using this approach 3,112 unique individuals have been identified.

2.4 Detecting Relationships

The next step in the visualisation process is detecting relationships between pairs of individuals in *S.* It is important to note that relationships are only extracted from the prose of *S* and not the poetic sections. This is because relationships and networks derived from different genres would function differently. These interactions become edges, which are drawn as lines connecting two nodes on network graphs (see Figure 4).

2.4.1 Chapters as Narrative Units

Relationships are manually detected and categorised by closely reading through the text and extracting them chapter-by-chapter. Chapters are used as narrative units because they often function as independent land-claim narratives centred on a settler and their descendants; therefore, they act as self-contained space. Of course, using chapters assumes a fixed relation between two individuals at a certain point of time which could be considered problematic because relationships transform over time. However, ‘even in complex narratives, relationships remain persistent within sub-parts’ (Srivastava et al. 2016, 2807-8). Smaller subdivisions like sentences or paragraphs are not used because they do not follow the natural textual divisions of *S*. Additionally, since these textual segments are typically short individuals in long genealogies might not be connected if sentences or paragraphs were selected as the narrative units.

The collection of relationships by chapter differs in method from the identification of individuals. Individuals can be attached to multiple chapters throughout *S*, but relationships are only attached to the chapter they appear in. For instance, if X and Y are identified as having a relationship in S1, and X has another relationship with Y in S6, X and Y are both attached to chapters S1 and S6 in the database. Each relationship is recorded separately, and one relationship is attached to chapter S1 and the other to S6. This approach allows for interactions between individuals to emerge naturally and can account for interactions that change i.e. two people who are friends in one chapter but feud in another. Additionally, different individuals like Kolskeggr may have compiled or heavily influenced different sections of *S*, therefore, it cannot be assumed that relationships between individuals remain consistent throughout the text (see IV).

2.4.2 Detecting Relationships

Relationships in *S* are usually explicit even bordering on formulaic in their construction making them easy to detect and enter in the database. A typical relation in *S* follows along the lines of 'person X relation with person Y', with the specific type of relation mentioned.[34] For instance, *Þormóðr ok Þórðr gnúpa, synir Odds ens rakka* 'Þormóðr and Þórðr *gnúpa*, sons of Oddr *enn rakki*', Þormóðr and Þórðr *gnúpa* are unquestionably the sons of Oddr *enn rakki* (S69). Conversely, Oddr is the father of Þormóðr and Þórðr, therefore, both father-son and son-father relationships can be entered into the database.

Both sets of relationships are identified because the network produced for this study is more flexible than a traditional genealogy. Genealogies are hierarchical in nature and tend to be recorded in descending order from an older to younger generation. By recording relationships in bidirectional pairs like father-son and son-father it allows for the ambiguous nature of the relationships in *Ldn* to be preserved. Often there is no background information given to contextualise a relationship and, in many cases, only the relationship itself is preserved. Thus, there is no definitive way to know the motivations or

[34] For more on the formulaic nature of chapters in *Ldn* see Adolf Friðriksson and Orri Vésteinsson (2003, 145).

emotions behind the relationships and how a father and son like Oddr and Þormóðr interacted (see 2.4.2.a.iii). Some relationships in the text are not explicitly mentioned but are implied. In many cases, an implicit relationship between two individuals can be inferred with confidence from contextual information. To detect these relationships, close-reading and interpreting subtleties in *S* is essential. Subjective decision-making also comes into play in identifying the specific roles of these individuals and the exact nature of their relationship so that it can be converted into data that accurately represents the text as much as possible. For instance, returning to the excerpt from S69, it is not explicitly stated that Þormóðr and Þórðr are brothers. Nevertheless, this relationship can be inferred because they share the same father. However, since there is no mention of their mother(s), they cannot be assumed to be full siblings. Therefore, they are assigned a relationship that reflects what can be confidently discerned from the text—that they at least half-brothers (see 2.5).

If the same type of relationship between two individuals is mentioned twice or more in a chapter, it is only entered once in the database. For instance, in S348 Hámundr is listed as the son of Gunnarr. Later in the chapter he is referenced with his patronymic, Gunnarsson. A father-son relationship could be extracted from both mentions, but only the first instance is recorded. This approach prevents the relationship from being assigned a higher level of importance than it might have in the narrative network.

Hámundr is also alluded to as the son of Gunnarr in other chapters (S325, S344-S345, S348). In these cases, the father-son relationships are recorded because chapters are separate narrative units. This method of entering relationships helps SNA to identify connections that might have been perceived as important. The number of father-son mentions between Hámundr and Gunnarr throughout *S* indicates that the relationship was worth remembering and documenting multiple times. If this relationship only appeared multiple times in one chapter, it would likely influence the land-claim narrative being discussed, but not be considered central to the overarching narrative of *S.*

If two individuals engage in multiple relationships in a chapter but these relationships have different functions (i.e. consanguineous kinship,

dispute), they are recorded as separate entities in the database. For example, in S365, Þorsteinn and Þorgeirr have two relationships with each other. The first is that they are brothers and the second being their joint migration to Iceland. Their familial bond is thought to have influenced their travel plans, but these are two distinct relationships—consanguineous and travel—that each merit being recorded to give a fuller picture of how people connect to each other in *S* (see 2.5). Furthermore, if two people are connected via several different types of relationships it indicates they frequently interacted and that their overall relationship should be investigated at a deeper level.

Co-occurrences, which are defined as individuals who appear in the same chapter, could be conceptualised as relationships; however, in this thesis they are not considered meaningful interactions that warrant recording. This is because they do not provide insight into social, political, and familial structures. Interactions are only recorded in the database and used in the construction of narrative networks if a meaningful affiliation or direct action between individuals can be identified from explicit or implicit textual context.

2.4.2.a Methodological considerations when detecting individuals and their relationships

2.4.2.a.i Relationships only from *Sturlubók*

Only relationships, individuals, and information explicitly referenced in *S* or that can be inferred from its internal logic are considered part of the *S*'s narrative networks. Many of the individuals in *S* appear in other redactions, and/or are cross-referenced in other ON-I material. However, inputting contextual information such as known relationships between individuals from outside of *S*, or conflating data from the different redactions during the data collection phase will distort the data because the networks of *S* would no longer be visualised. Yet, this supplemental evidence is still useful when analysing the social circle of an individual or a geographic region of Iceland because it may explain why certain individuals are interacting with each other. Alternatively, if relationships between two known individuals in other areas of

the ON-I corpus do not correspond to those in *S*, then questions may be raised about the historicity of the sources.

The only individuals and relationships in *S* that are not included in the dataset are those exclusively found in the poetic sections of *S*. Since poetry and prose are different writing styles, they produce different types of network graphs. This is because social and character networks tend to emulate the form and characteristics of the dataset that they are constructed from (Labatut and Bost 2019, 4). To effectively study relationships found in ON-I poetry, a different methodology would need to be created that considers its specific complexities e.g. metre, alliteration, *kenningar* 'kennings'. Therefore, to construct a stylistically consistent network, only individuals and relationships found in *S*'s prose are used.

2.4.2.a.ii Undirected and directed relationships

There is a basic assumption when entering relationships in the database that both individuals are equally involved. In social-network terminology these relationships are considered 'undirected'. In visualisations undirected relationships visualise as unordered pairs in the form of edges (de Nooy et al. 2005, 7). On the other hand, in 'directed' relationships one person functions as the 'sender' of the relationship and the individual they intend to enter the relationship with is the 'receiver'. In visualisations directed relationships function as ordered pairs taking the form of arcs with an arrow starting at the sender/source and pointing to the receiver/target. Unlike in undirected relationships, choice does not need to be reciprocated in directed relationships.

Here the narrative networks are considered undirected because there are no arcs: all network graphs are constructed with edges/undirected relationships. However, it is important to note that most familial relationships can be considered as bidirectional arcs. For instance, if a relationship is phrased as 'X and Y are brothers' it would be undirected. If this same relationship was re-worded as 'X is the brother of Y' it would be directed because there is a clear source and target. However, in this thesis all relationships are considered undirected because there are a variety of relationships being examined—not

only consanguineous ones. Selecting one consistent stance on directionality instead of taking a mixed network approach (directed and undirected relationships) increases efficiency in entering relationships because it reduces subjectivity in determining whether an individual is the sender or receiver and assigning importance to individuals based on this status.

What is impacted by entering relationships as undirected is the total number of relationships in the network. Since both sides of a relationship—father-son/son-father—are entered in the database, the final count of relationships is doubled. This is accounted for when working with overarching statistics by correcting the numbers of relationships by reducing them by half. This does not impact percentages relating to individuals or relationships. For the most part this 'doubling' will not impact the visualisations of the *S*'s networks because the two individuals will still be connected to each other through their main relationship type (consanguineous, affinal, disputes, etc.) and not by their relationship subtype (father, son, husband, wife, etc.) (see 2.5 esp. 2.5.1). Accurate levels of interactions between individuals in the text are still visualised because everyone's relationships are entered in this manner. If anything is impacted, it will be how thick the lines appear when looking at individuals who share multiple relationships because the more relationships between a pair, the more prominent the edge on the visualisation. However, this is mitigated by using the merge function in *Gephi*, which can merge edges together using different algorithms to fit specific purposes, in this case reducing the impact of doubling.

2.4.2.a.iii Neutral relationships

Relationships in this thesis are considered 'neutral' at the data collection and entry phases. Outside of dispute or friendship relationships there is not enough context to assume a relationship is 'positive' or 'negative'. This can be useful for distinguishing broad patterns of conflict and friendship; however, it is too simplistic to be applied to *S*.[35] This is because being a blood relative does not automatically indicate that a relationship is friendly; in some cases, it can lead

[35] See Yose et al. (2018) for defining negative and positive relationships in the network of a medieval text.

to bloodshed. Therefore, people's emotions towards others in *S* are discussed during analysis of the case studied when this background information is readily available. Here the relationships themselves are important to understanding the narrative structure of *S*, not how individuals perceived themselves within the network.

2.4.2.a.iv Asynchronous relationships

Exact dates of when individuals lived or when their interactions occurred are not input in the database because dates are very rarely recorded in *S*.[36] Since the text is not a straightforward chronological narrative it is hard to determine when a person might have arrived in Iceland during the settlement period and who their contemporaries were. Occasionally, *S* does give some relative chronology by indicating that certain settlers arrived earlier or later than others in the settlement period, but in most cases this information is not included in *landnám* descriptions (e.g. S9, S326; see also 5.2.1.b). Therefore, relationships are entered based on two individuals connecting in the text irrespective of time. Ultimately, this does not impact the network massively because the setting of *S* occurs largely during (and shortly before and after) the *landnám* which creates cohesive temporal boundaries for the narrative network.

2.5 Defining and Categorising Relationships

Once a relationship is established between two individuals in *S*, it is defined and categorised so that visualisations and quantitative results can represent the textual society as faithfully as possible. Defining relationships is important because interactions can be classified using different approaches which largely depend on the character of the narrative (Labatut and Bost 2019, 89). For this reason, this thesis uses its own relationship classification system based on the most common types of interactions in in *S*. Therefore, this approach cannot be directly replicated for another text in the ON-I corpus, although some elements

[36] The only exact dates referenced in *S* are those of Bede's death, and the date when Ingólfr and Hjǫrleifr go to Iceland in relation to the reign of King Haraldr (S1, S8). There are references alluding to how long it took to fully settle Iceland (sixty years) and that the country remained pagan for 120 years after settlement, but the actual dates are not listed and can only be approximated based on the information provided (S398-S399).

can be adapted to develop an overarching methodology for relationships in these texts in the future.

Since *S* has genealogical and geographical structure and is a narrative of settlement, relationships take on two overarching forms which are affiliations and direct interactions.[37] Affiliations are relationships that do not 'correspond to actions but rather to states' (Labatut and Bost 2019, 26). There are four types of affiliations found in *S*:

- Consanguineous kinship
- Affinal kinship
- Fictive kinship
- Enslavement and household relationships

As the name implies, direct actions involve an individual partaking in an action with another individual. There are six types of relationships based on direct actions found in *S*:

- Land relationships
- Dispute relationships
- Travel relationships
- Association relationships
- Hosting relationships
- Religious relationships

All relationships are classified according to their category of best fit. This is often a self-explanatory process because ON-I relational terms are used throughout the text, therefore, it is easy to distinguish relationships i.e. consanguineous and dispute from one another. In cases where a relationship does not fit any of the above classifications, but there is a connection between two people, the relationship is assigned to the category of 'other' relationships.

This study has restricted itself to these eleven relationship categories because any more than this number would clutter network visualisations and inhibit the ability to interpret broad patterns on network graphs. Fewer

[37] See Borgatti and Ofem (2010) cited in McGee and Warms (2016, 595-6) for a simplified typology of relationship types in social networks.

categories than these would produce network-level graphs which do not as accurately reflect how individuals are connected to each other in *S*.

2.5.1 Relationship Subtypes

To analyse relationships at the individual- and group-level, relationship subtypes are recorded in the database. Relationship subtypes preserve the specific roles of individuals in a relationship. For example, *Skjǫldólfr Vémundarson* 'Skjǫldólfr son of Vémundr', it is clear Skjǫldólfr and Vémundr are in a consanguineous kinship relationship where Vémundr is the father and Skjǫldólfr is the son (S275). The categories of 'father' and 'son' are considered subtypes because these roles combine to form the overarching consanguineous kinship relationship.

Subtypes are not visualised at the network-wide level because there are too many to display at the same time on network-level graphs. However, visualisations featuring a curated selection of relationship subtypes can be produced (see Figure 103). Recording subtypes also enables the calculation of simple statistics i.e. how many father-son relationships are in *S* which can then be interpreted using conventional historical and literary analysis.

Around 250 subtypes of the main relationship categories have been identified and recorded. Instead of defining each relationship subtype because many appear only once or twice, just the subtypes of consanguineous and affinal relationships will be described in detail. This is because they comprise 80% of the total relationships in *S* and some special factors are considered when conceptualising and defining these relationships. Other less common relationship types and subtypes will be discussed when relevant to case study analysis.

2.5.1.a Consanguineous kinship relationships and subtypes

The overwhelming majority of relationships in *S* (72.62%) are categorised as consanguineous kinship relationships. Here consanguinity is defined as 'the kinship of two individuals characterized by the sharing of common ancestor(s)' (Lefranc and Lefranc 2013, 158). These relationships are straightforward to

detect and define because the text is structured to showcase genealogical charters and is rife with familial vocabulary like *faðir* 'father', *móðir* 'mother', *bróðir* 'brother', *systir* 'sister' as well as patronymics and metronymics which indicate the role of an individual within a family tree. These terms naturally lend themselves to the naming of relationship subtypes in the consanguineous kinship relationship category. Figure 7 is a full list of consanguineous kinship relationships in *S*.

Consanguineous Kinship Subtype	ON-I Term	Notes /Examples
father	*faðir*	
mother	*móðir*	
son	*sonr*	Can be patronymic/metronymic
daughter	*dóttir*	Can be patronymic/metronymic
brother	*bróðir*	
sister	*systir*	
half-brother	*hálfbróðir*	*Hallkell, bróðir Ketilbjarnar sammœddr* 'Hallkell, brother of Ketilbjǫrn by the same mother' (S389)
half-sister	*hálfsystir*	
at_least_half-brother	NA	When only one parent is mentioned with their children, the children are given the designation of 'at_least_half-brother/sister'
at_least_half-sister	NA	See above
nephew	*bróðursonr* (paternal), *systursonr* (maternal)	
niece	*bróðurdóttir* (paternal), *systurdóttir* (maternal)	

Consanguineous Kinship Subtype	ON-I Term	Notes /Examples
uncle	*fǫðurbróðir* (paternal), *móðursystir* (maternal)	A person is assigned the subtype of 'uncle' if they are mentioned in relation to a nephew or niece.
aunt	*fǫðursystir* (paternal), *móðursystir* (maternal)	
kinsman	*frændi* (masc.), *frændkona* (fem.)	
cousin	*bræðrungr* (paternal), *systrungr* (maternal)	
grandfather	*fǫðurfaðir* (paternal), *móðurfaðir* (maternal)	
grandmother	*fǫðurmóðir* (paternal), *móðurmóðir* (maternal)	
grandson	*sonarsonr*, *dóttursonr*	
granddaughter	*sonardóttir, dótturdóttir*	
illegitimate_son	*laungetinn, frillubarn*	
illegitimate_daughter	*frillubarn*	
illegitimate_brother[38]	*laungetinn, frillubarn*	

[38] There is no illegitimate_sister category because there is only one illegitimate daughter in *S*, Vigdís, and she is mentioned with her at_least_half-brother Jǫrundr *hál*s, who is also illegitimate (S179).

Consanguineous Kinship Subtype	ON-I Term	Notes /Examples
lineage	*eru frá komnir*	*Úlfr aurgoði, er Oddaverjar eru frá komnir ok Sturlungar* 'Úlfr *aurgoði,* who the Oddaverjar and Sturlungar descend from' (S346). Also, names of groups of children like *Baugssynir* (S348)

Figure 7 Consanguineous kinship relationship subtypes[39]

Even in cases where consanguineous kinship relationships are extracted from implicit information, these relationships are usually easy to identify and enter with certainty. For instance, in the case of sibling relationships there is usually no text explicitly stating that individuals are siblings, but if they are listed together under the same parents, *Þeira bǫrn váru þau Þorlaug,…, ok Þórarinn* 'Their children were Þorlaug…, and Þórarinn' it can be assumed with confidence that they were siblings (S187). Even in situations where not all information is apparent, but people are linked via consanguinity, a relationship subtype can easily be created to describe what is known about the relationship e.g. at_least_half_brother. Both lineal kinship—parent-child—and collateral kinship relationships—sibling relationships—fall under the broader category of consanguineous kinship, but the differences in these types of kinship connections will be discussed when relevant in analysis.

It is important to note that relationships between individuals are only recorded within one degree of consanguinity, to minimise assumptions on whether people held active relationships with ancestors or descendants across several generations (see 2.4.2.a.iv). A relationship between a parent and child will be input in the database as a consanguineous kinship because this relationship is only separated by one generation. A relationship between a grandparent and grandchild will not be inserted because they are two generations removed from each other and it is a supposition to believe that all

[39] Some of these terms are not used in *S* but are added for reference.

grandparents were still alive and interacting with their grandchildren. If the relationship between grandparents and grandchildren is explicitly stated in *S* such as Loptr and his relationship with his maternal grandfather Þorbjǫrn, *Loptr …, er Þorbjǫrn móðurfaðir*, then it is recorded (S368).

Individuals are also not connected to non-nuclear family members including their consanguineous uncles, aunts, cousins, and more distant relatives unless explicitly or implicitly linked in the text because these individuals are often one or more degrees away in a network. There is no way of knowing if people had relationships with non-nuclear family members unless stated in the text. It is likely that people would have been aware of their lineage and interacted with these individuals in some capacity, but this method enables the network to take on a genealogical structure which better reflects the text.

For example, if everyone within the same genealogy, *Ketill gufa hét maðr Ørlygsson, Bǫðvarssonar, Vígsterkssonar* 'There was a man called Ketill *gufa*, son of Ørlygr, son of Bǫðvarr, son of Vígsterkr' was arbitrarily linked to each other just because they share a common ancestor, the graph would appear as a tangled mess with no indication of which generation each individual belongs to (S125). This method is displayed on the left side of Figure 8. Entering the same genealogy but only linking each father and son dyad and not connecting all ancestors together, mimics a classic genealogy as presented in *S.* Ketill is still in a sense connected to his grandfather, Bǫðvarr, in the social network via his father, Ørlygr, and all these men can still be identified within the same family strand. This approach is shown on the right-side graph in Figure 8. Additionally, this method allows for other types of relationships (affinal kinship, fictive kinship, etc.) to be connected directly to the individuals involved and not be superimposed upon an entire family grouping which creates some time depth separation. For instance, a woman who marries into the family would only be directly connected to the man she is marrying, not his parents. Their children would only be connected to them and not be connected to their grandparents. This allows different generations to be distinguished in

the network while also allow people to ‘reach’ others in their family through intermediaries.

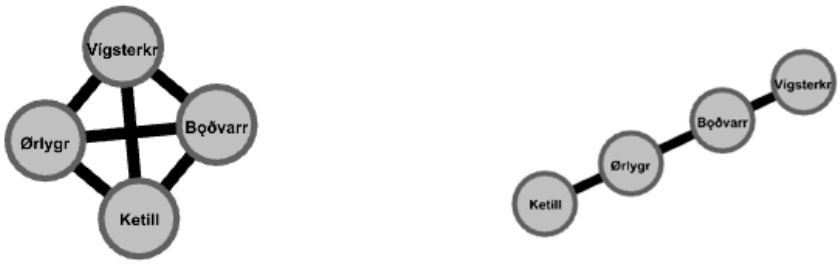


Figure 8 Everyone in family connected regardless of generation (left), individuals within the same family only connected within one degree (right)

The main exception to entering relationships beyond one degree of consanguinity are lineage relationships. These relationships are formed when an individual listed as a progenitor of a group, such as *Óláfr, er Nesmenn eru frá komnir* ‘Óláfr, who the Nesmenn are descended from’ or when a person has a large group of children predominantly sons who are grouped together under a name like the *Ingimundarsynir*, ‘sons of Ingimundr’ (S180, S292). These are entered as consanguineous kinship relationships with ‘lineage’ placed as the subtype for both the progenitor, Óláfr/Ingimundr, and the group descended from them, Nesmenn/Ingimundarsynir. Individuals within these groups can still be connected to each other via different relationship types.

Another consanguineous kinship relationship subtype to draw attention to is having an illegitimate child, *laungetinn*. In these instances, the individual who is recognised as the illegitimate sibling or child is recorded in the database and connected to others using relationship subtypes such as ‘illegitimate_brother’ or ‘illegitimate_son’. Conversely, legitimate siblings and parents of the illegitimate individual are entered as ‘half-sister/-brother’ or ‘father’ or ‘mother’ to preserve the difference in status.

2.5.1.b Affinal kinship relationships and subtypes

Affinity—connections that relate to marriage—is socially constructed concept and varies in definition across different cultures. Affinal relationships are

detected from ON-I marital vocabulary and other societal, cultural, and legal scenes implying that a marriage happened in *S.*

The most common affinal kinship subtypes are ‘husband’ and ‘wife’ because there are just under 650 marriages in *S*. There is an emphasis on marriage in the text because these relationships connect different families together (see 6.4 and 6.5). It is easy to identify marriages because there are explicit phrases or terms indicating the act took place: X *fekk* Y, X *átti* Y ‘X was married to Y’, *brúðkaup* ‘wedding, literally purchase of bride’.[40] The word order can vary in these constructions for example *Hafþóra, er Eiðr Skeggjason átti* ‘Hafþóra, who Eiðr, son of Skeggi, married’, but the almost formulaic structure of the marriage relationship remains, which includes a feminine personal name, masculine personal name, and marriage term (S341). The terms *bóndi* ‘husband’ or *kona* ‘wife’ also imply two individuals were married by denoting the exact role in the relationship, *Signý kona Qndótts ‘*Signý wife of Qndóttr’ (S229).[41]

A marriage is also inserted in the database if two individuals have children together: *þeira synir* ‘their sons’, *Sigríðr, móðir Bersa Qzurarsonar* ‘Sigríðr, mother of Bersi, son of Qzurr’ (S275). In these cases, it cannot be said with complete certainty that these people were married. However, since illegitimate children are rarely recorded in *S* (or more generally in the ON-I corpus), it is likely that these individuals conceived their child(ren) in wedlock, thus they are treated as a marital unit (Jochens 1991, 361, 385). In instances where a woman and man have a child out of wedlock, it will still be recorded as an affinal kinship relationship under the subtype ‘had_child_together’

[40] The verb *fá* has a variety of meanings, but the sense is to ‘get, gain, win’, with the acc. of the thing being taken. Here a man is ‘getting a woman’s hand (in marriage)’ (ONP). The verb *eiga* ‘to own, to possess, to have’ also has a variety of meanings, but when employed as *átti* (sg. past indicative) alongside personal names in the context of marriage it implies having an individual as a husband/wife.

[41] *Kona* is also a general term for ‘woman’, but it is clear in the text whether *kona* refers to a ‘wife’ or a ‘woman’. *Bóndi* can also mean ‘husbandman, farmer, peasant, landowner’ again it is straightforward when it is either employed in a landholding sense or to indicate an individual is a ‘husband’ in a marital sense.

because although not bound through matrimony they are still legally and socially connected through their child.[42]

Individuals can also acquire step-children through marriage. Since these children are not blood-relatives it is considered an affinal kinship relationship. These relationships are only identified through explicit references like *stjúpdóttir* 'step-daughter' and *stjúpr* 'step-son'. These children are only associated with other potential half-siblings if mentioned within the same chapter. Children are assumed to be full-blooded offspring in *S* unless evidence suggests otherwise. It is important to record these outliers like stepchildren and illegitimate children because it provides evidence for blended families.

In-laws are identified through variants of the term *mágr* 'in-law'. These individuals are only connected if it is explicitly mentioned that they are in-laws the text, *Hallsteinn hét maðr, er fór ór Sogni til Íslands, mágr Hásteins* 'A man called Hallsteinn, who left from Sogn to Iceland, in-law of Hásteinn' (S372). This choice follows the one degree of connection principle. This does not prevent that in-laws from having different exchanges in *S* even if they are not recorded as in-laws in the database.

The most difficult affinal relationships to record are marital arrangements. It could be assumed that social and political arrangements underly most if not all marriages in *S*, but there are only fifteen chapters that explicitly discuss the processes of arranging a marriage or an attempt to arrange a marriage between individuals. For instance, *Helgi gaf Þóru dóttur sína Gunnari syni Úlfljóts* 'Helgi gave his daughter [in marriage] to Gunnarr,

[42] According to medieval Icelandic law codes, illegitimate children could inherit their parents' property if certain conditions were met (*Grágás* 47-8, 62, 71, 74). Additionally, concubines are mentioned in several medieval Scandinavian law codes. Provisions for individuals in extramarital affairs as well as the inclusion of concubinage in legal texts imply that to some extent that these relationships are socially and legally recognised and that individuals in these types of relationships still had to conform to societal norms. However, the status that concubines held in society is difficult to discern because the role changes over time in the laws and there are few distinctions made between freeborn and enslaved concubines (see Karras 1990, esp. 142, 145; see also Jochens 1991 on illicit relationships).

son of Úlfljótr' (S63, S95, S97, S108, S125, S133, S149, S231, S232, S235, S257, S284, S290, S348, S386).[43]

These 'marriage_alliance' relationships are entered on a case-by-case basis. Generally, a 'marriage_alliance' relationship subtype is attributed to the two arranging the marriage. The subtype indicates that the two families are merging at the behest of these individuals. Usually, these actors are the man being married, his father, or kinsman from one family and the father of the bride from another family. The bride and groom are linked in an affinal kinship relationship the subtypes 'wife' and 'husband' are used even if it is clear this marriage is arranged because these better fits their long-term roles. Other individuals may or not be entered in the 'marriage_alliance' relationship subtype depending on the other kinship relationships that they have with other individuals. For instance, even though Mǫrðr is asking for Þorkatla's hand on Eilífr's behalf, Mǫrðr and Eilífr are not entered under a 'marital alliance' affinal kinship relationship because they are not affines, but kinsman related through blood (S348).

If there is a transfer of land as part of a dowry, it is entered as a land relationship and attached to the relevant individuals depending on the text. For example, *Eilífr auðgi, son Ǫnundar bílds, fekk Þorkǫtlu Ketilbjarnardóttur, ok fylgðu <henni> heiman Hǫfðalǫnd*, 'Eilífr *auðgi*, son of Ǫnundr *bíldr*, married Þorkatla, daughter of Ketilbjǫrn, and her dowry was Hǫfðaland' (S387). Here there is a land relationship categorised as a dowry subtype between Ketilbjǫrn and Þorkatla because the land is explicitly referred to as hers, *fylgðu <henni>*. If the man is granted land or told where to settle based on marrying another man's daughter, it will be entered as that specific land subtype.

In many instances the marital arrangement is implied, but it is not mentioned. For instance, it could be assumed that Hámundr is granted land

[43] This count does not contain all dowries, it only considers chapters where the act of giving the daughter to another man, asking for the hand of an individual, or actively orchestrating a marriage is explicit. Dowries can be included in these processes, but sometimes the dowry is mentioned independent of the act of arrangement, though this arrangement might be implied (S37, S282, S387).

because he marries Helgi's daughter, *Helgi enn magri gaf Hámundi mági sínum land milli Merkigils ok Skjálgdalsár, ok bjó hann á Espihóli enum syðra* 'Helgi *enn magri* granted land to Hámundr, his son-in-law, between Merkigill and Skjálgdalsá, and Hámundr lived at South Espihóll (S230). Since the marriage arrangement is not explicitly mentioned, a relationship is not created in the database under this subtype. There are still affinal kinship relationships connecting Hámundr and Helgi because they are mentioned as in-laws and Hámundr is explicitly mentioned as being married to Helga, Helgi's daughter in S232. Hámundr and Helgi are also connected through land granting, but it is recorded as a land relationship because in is not established if it is part of Helga's dowry. The strong affinal and land ties between Hámundr and Helgi are still represented in the network but determining why the land was given requires literary analysis which cannot be input neatly into a database, therefore, only what is known is entered and analysis of the graph. All affinal kinship relationship subtypes are found in Figure 9.

Affinal kinship subtype	ON-I term(s) or phrases	Notes
husband	X *átti* Y, X *gekk* Y, X *fékk* Y, X *gipti* Y	
wife	X *átti* Y, *kona*, X *gekk* Y, X *fékk* Y, X *gipti* Y	
in-law	*mágr*	
marriage_alliance		'Then Mǫrðr asked for the hand of *Þorkatla*, daughter of Ketilbjǫrn on behalf of Eilífr' *Þá bað Mǫrðr til handa Eilífi Þorkǫtlu Ketilbjarnardóttur* (S348).

Affinal kinship subtype	ON-I term(s) or phrases	Notes
step-father	*stjúpfaðir*	
step-daughter	*stjúpdóttir*	
step-son	*stjúpsonr*	*Surts ens hvíta Skaptastjúps*, ‘Surtr *enn hvíti* step-son of Skapti’ (S334).
had_child_together		*ok var hon með barni um várit*, ‘by spring she was with child’ (S284).
exchanged_wives		e.g. S41

Figure 9 Affinal kinship relationship subtypes

2.6 The Database

The dataset of individuals and their relationships is stored in five tables in Access: 'nodes', 'attestation', 'Sturlubók_relationship_attestations', 'place_relationships' and 'settlers'.[44] Standard Query Language (SQL) is used to query the dataset to retrieve and prepare information needed for case studies, and to format it to be imported into the SNA software, *Gephi*.[45]

It is Access' innate compatibility with Excel and its ease of use which made it the logical choice over other database management systems for this project. No actual analysis of the data is happening in Access, and it is not viewed as a replacement for *S.* Access is simply used as a tool for storing, formatting, querying, and organising data. However, it is still important to consider how these processes transform 'raw' data from *S* to 'clean' data used for analysis.

The transformation of data at any point impacts the quality and presentation of the visualised 'final' data, which in turn influences how network graphs are interpreted. To ensure that the final data produced is at the standard necessary to analyse the relationships between individuals in *S* as accurately as possible, each step of the methodology accounts for specific issues that arise when converting *S* into data. Therefore, there is information intentionally left out of the database because will be distorted beyond recognition if subjected to this approach. Nevertheless, it can always be retrieved from the text or other sources using conventional historical or literary methods if needed for analysis.

All choices in how to represent individuals and relationships in the database as well as how the information from the database is exported into Excel and *Gephi* are detailed in sections below (2.6.1 and 2.6.2). Once the

[44] Each table in a database stores data about a particular subject. In a relational database like Access, subjects can be linked across tables.
[45] SQL is a standardised programming language used to manage data in relational database systems like Access which gives the user the ability to 'query', make a question or request of the data using specific statements.

social networks of *S* are visualised in *Gephi*, analysis of these graphs and quantifications can begin. During the analysis stage, the database will still be used as a reference to find information pertaining to individuals in the network, or for computing simple statistics.

2.6.1. Recording Individuals in the Database

2.6.1.a Individuals as nodes

There are two tables in the database dedicated to recording individuals in *S*: the nodes table and the attestation table. The function of the nodes table is to ensure that every individual mentioned within the text receives their own unique identifier so that their interactions can be accurately traced throughout the text and are not misattributed to another individual. The identification number of an individual alongside their label enables the visualisation of individuals as nodes in SNA. A figure of the nodes table is shown in Figure 10, it is comprised of the 'person_ID', Column (C) 1, and 'standard_name', C2, which are described in more detail below.[46]

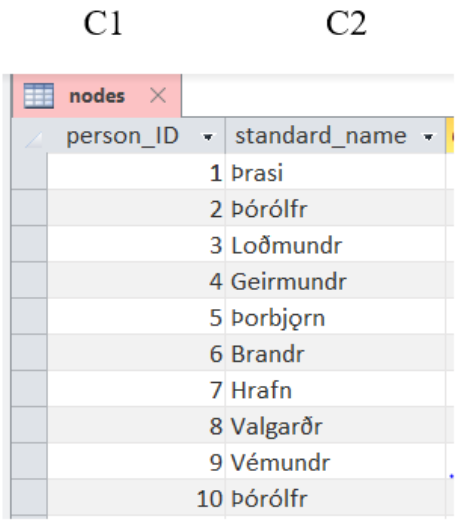


Figure 10 Nodes table in Access

[46] Column names in text will reflect the heading in the database. Inverted commas are used to distinguish column names from the material entered in the column. Thus 'standard_name' is the name of the column. The standard name of the individual is what is input in the column. Underscores are typically used as spaces in database entries.

When the first reference to an individual appears in the text under the form of a personal name, byname, or patronym, it is entered in the node table under the ‘standard_name’ column (see Figure 2, C2). The ‘standard_name’ column acts as a label for the person_ID, linking a name or descriptor to the identification number (the person_ID) automatically generated by Access in C1. Normally the standard_name will be the normalised ON-I personal name in the nominative case of the identified individual as recorded in *Nafnaskrá* ‘name list’ of ÍFI (pp. 441-525). However, not all individuals are known by their personal name, therefore, using a standard_name provides more flexibility. For example, Grímr Kveldúlfsson is more widely known as Skalla-Grímr throughout the text therefore this form is entered as the standard_name. This is also reflected in the head form in *Nafnaskrá* (ÍFI p. 496). However, his birth name Grímr and patronym are still recorded in the attestation table as further identifying factors (see 2.6.1.b).

Kinship groups such as the Vallverjar, Oddaverjar and Sturlungar also act as nodes in the narrative network, so they are likewise conceptualised as individuals and entered in the standard_name column (S185, S346, S362). It is still acknowledged in the database that these labels reference a group (see 2.6.1.b).

There are also a few non-human entities included in the database like the god Þórr (S85, S123, S197, S218, S343). He and other mythological beings are part of the network because they form meaningful relationships with other individuals, which often impact other settlers. For instance, a few people choose where to settle based off Þórr’s guidance or dedicated land to him. In turn this would prevent other people from settling on that piece of land. Similarly to kinship groups, non-human entities are conceptualised as individuals to construct the network, but their distinctiveness is acknowledged in the database. It is important to note that named animals like the cow Brynja, are not part of this dataset (S18). Although, meaningful, animal-human relationships are outside the scope of the present study and tend to only impact a singular land-claim narrative.

Occasionally there is only an allusion to an individual or group and they are not explicitly referenced, or a lacuna in the text prevents their name(s) from being recovered. In these cases, an individual can be entered in the database if they have relationships with other individuals, an affiliation with another person, or a role in a narrative(s). For example, *Jǫrundr átti... Þeira son var Valgarðr goði, faðir Marðar, ok Úlfr aurgoði, er Oddaverjar eru frá komnir ok Sturlungar. Margt stórmenni er frá Jǫrundi komit á Ísland* 'Jǫrundr married […] Their sons were Valgarð*r goði,* father of Mǫrðr, and Úlfr *aurgoði,* who the Oddaverjar and Sturlungar descend from. Many great people in Iceland come from Jǫrundr' (S346). A fem. personal name was meant to be inserted after Jǫrundr's because *Þeira son* 'their sons' indicates that a woman not only married Jǫrundr, but also had children with him.

In the *H* redaction of *Ldn*, Jǫrundr has not one, but two women named as his wives, Þuríðr and Þorlaug (H305). Either could be theoretically used to fill the omission in *S*. However, neither is inserted in a relationship with Jǫrundr because it would not faithfully represent that there is a lacuna in *S* and here Jǫrundr's wife's name is currently unknown. Additionally preserving these gaps are of interest because it could indicate that Sturla assumed that Jǫrundr only had one wife and did not know this woman's name, that he did not confidently know which of the two was the mother of the named children, or that *H* had different sources for these genealogies (S346n4). Therefore, in these cases it is important to not speculate and arbitrarily insert an individual who may be identifiable in other areas of the ON-I corpus in the narrative network of *S.*

In cases where a name is not known or can only be partially recovered, a generic label is created for the individual based on their most prominent relationship in the text. The label created for the example above would be 'Jǫrundr's_wife'. This allows the unnamed individual to be assigned an ID number and be connected to other people in the network.

Generic unnamed groups of people are entered based on whether they meet one of the criteria mentioned above. For instance, *En meðan Ketill var vestr, þá hljópu þrælar hans á braut ok komu fram um nótt á Lambastǫðum* 'While Ketill was in the west, his enslaved people ran away and arrived one night at Lambastaðir', it can be determined that there is a relationship of enslavement where these *þrælar* 'enslaved people' are owned by Ketill (S125; see 2.5). They also commit a house burning so they also have a clear narrative function. Therefore, the label, 'Ketill's_þrælar', can be inserted in the standard_name column and a unique identifier can be assigned.

There are some unnamed groups in *S* which are not entered into the database or considered part of the network because they have no clear relationships, or they do not serve a narrative purpose. For example, the *þeir váru víkingar tólf frjálsir ok sveinar umfram* 'There were twelve free Vikings and also servants', mentions a specific number of Vikings and a group of servants, but their relationships to named individuals are unclear (S168). It cannot be discerned who comprises this group of Vikings or who the servants are enslaved to. Furthermore, they do not add much value to text other than increasing the size of the retinues of the named individuals they are travelling with; therefore, they add no relational value to the network.

Of course, choosing whether to include unnamed individuals and groups in the network is a subjective endeavour, but these occurrences are usually self-contained in one chapter of *S*, and decisions on whether to include certain groups or not in the network are preserved in the database (see below). Additionally, whether these unnamed groups are inserted in the network or not has little influence on the overall structure of the network. This is because they are usually minor players who only have a relationship with one named individual, who is likely already recognised as an important person in the network if they have enough influence to muster a retinue.

The text does not represent the entire population of Iceland during the settlement period therefore certain groups of people like women and those of

lower social status are under-recorded for a variety of reasons (Jacobsen 2005; Brink 2021). This is most noticeably reflected in genealogical gaps where mothers and wives are expected but do not appear (see 6.1.1). For instance, there are several genealogies where only the patrilineal line is preserved or only the father and his children are mentioned and not the wife/mother, *Hans [Hallsteinn] son var Þorsteinn, faðir Arngríms, er veginn var at fauskagrepti, hans son Þorbjǫrn á Framnesi* 'His [Hallsteinn] son was Þorsteinn, father of Arngrímr, who was killed digging up dry logs, his son was Þorbjǫrn of Framnes' (S372). Here only Hallsteinn, Þorsteinn, Arngrímr, and Þorbjǫrn are entered in the database and included in the network even though it could be assumed that they all had wives and mothers, there is even a high probability that they had daughters and sisters who were unrecorded for a myriad of reasons. Placeholders or 'dummy' individuals which represent these unnamed/unrecorded women have not been added to preserve these omissions in the text. This approach allows for these gaps and absences in genealogies to be visualised with SNA and perhaps provide insight into why certain individuals or groups are only mentioned in specific contexts. Thus, new patterns can emerge based on who is in the text and not those who exist outside it.

2.6.1.b Tracking attestations of individuals in Sturlubók

The attestation table in Access stores characteristics of individuals which they can be identified and categorised by (i.e. gender, whether they are a settler), and information about where these individuals are attested throughout the text. Data is organised and formatted in this table so that the relevant information needed for case studies can be extracted and imported into *Gephi.* Assigning different attributes to individuals enables nodes to be recoloured and manipulated in network graphs to get different views of the network.

Due to constraints of space, all elements tracked in the table are listed below and only elements relevant to the general methodology of this thesis will be discussed. Attributes used to develop case studies will be discussed in their

relevant chapters, which are signposted below. The following information for every individual in *S* has been recorded in the attestations table:

- Their person_ID (see 2.2, 2.3)
- Their standard_name (see 2.2)
- Their byname (if they have one) (see below)
- Their patronymic (if they have one)
- The chapter(s) of *S* they are recorded in
- Their *Nafnaskrá* p. reference
- Their Quarter(s) of reference (see III esp. 3.2, 3.3)
- If they are in Kolskeggr's contribution (see IV esp. 4.1)
- If they are mentioned in Kolskeggr's contribution and elsewhere in the text
- If they are only mentioned in Kolskeggr's contribution
- If they are a *landnámsmaðr* (see 5.1)
- Their type of land-claim (see 5.3)
- If they are a primary, secondary, or dependent settler (see 5.3.1)
- Their gender: woman, man, kinship group, or non-human entity (see 6.2)
- If they are an enslaved person or work in a household
- If they are mentioned as an important settler at the end of a Quarter section (see 3.2.2.b)
- If they are mentioned in Ingólfr's land-claim (see 3.2, 3.3.1)
- If they are mentioned in Ingólfr's land-claim and elsewhere in the text
- If they are only mentioned in Ingólfr's land-claim
- If they are mentioned in Skalla-Grímr's land-claim (see 3.2.1.a, 3.3.1)
- If they are mentioned in Skalla-Grímr's land-claim and elsewhere in the text
- If they are only mentioned in Skalla-Grímr's land-claim
- If they are part of the nobility or royalty
- If they are a member of the clergy
- If they are identified as a *goði*
- If they are identified as a lawspeaker
- Any additional notes pertinent to that individual
- Date the entry for that individual was recorded

The column for the 'byname' attribute includes locative bynames, bynames pertaining to status, and nicknames. Locative bynames like Brandr *í Skógum* 'of Skógar', Lambi *á Lambastǫðum* 'of Lambastaðir', and Sæmundr

enn suðreyski ‘the Hebridean’ are important because they place individuals in the Icelandic landscape, attach them to a location in the Viking diaspora, or provide information about their origin (S188, S337, S345). Of course, these locations are not necessarily indicators that these individuals were here at any given point in time, but it is of interest that people were attached to these named places in *S*. More detailed information regarding origins of individuals and places where people settle in Iceland is recorded for reference in the ‘place_relationships’ table in the database.

Bynames including titles like Burisláfr *Garðakonungr* ‘king of Russia’ and Gormr *hersir ágætr í Svíþjóð* ‘a great hersir in Sweden’ indicate social status (S205). Titles also tend to be associated with geographical locations and help provide insight into the power structure of Iceland and areas abroad. Nicknames in the ON-I corpus are often descriptive but, in unique cases, can even provide the ‘basis of an entire saga character’s biography, and were used as a narrative tool in oral tradition’ (Peterson 2019, 91). On the rare occasions nicknames are explained in *S* it is usually done through brief anecdotes, which break from the typical genealogical style of the text. For instance, Þuríðr was given the nickname *sundafyllir* ‘sound-filler’ because she filled every sound in Hálogaland, Norway with fish using witchcraft during a famine (S145). From the story attached to the bestowal of the nickname, it is apparent that she is involved in witchcraft of some sort and from Hálogaland. These instances may also indicate that this portion of *S* was borrowed from another text. However, most nicknames are left unexplained in *S* like Loðmundr *enn gamli* ‘the old’ and Bjǫrn *enn hávi* ‘the tall’ (S289, S302). This does not mean no identifying or interesting information can be gleaned from them. For example, *enn gamli* could distinguish an older relative from a younger one sharing the same personal name and *enn hávi* could indicate the physical stature of the man or serve as ‘a *heiti* for the god Óðinn, where it is more likely to mean “the high (status)” as opposed to “the tall”’ (Peterson 2015, 147-8, 158). Considering Bjǫrn *enn hávi* had the purchasing power to buy a land-claim and is the progenitor of the Berufirðingar family group either interpretation could be a possibility. In this way the byname column serves its purpose in the database as depository for all onomastic information that is not a personal name,

standard_name, or patronym relating to a specific individual. This categorisation is not semantically or linguistically perfect, but the intention is not to provide an exhaustive list of bynames, but rather to see if these bynames influence relationships and perceptions between individuals in *S.*

2.6.2 Relationships as Edges: Recording Relationships in the Database

After being detected and defined, each relationship is entered as a pair of interactions between two individuals in the Sturlubók_relationship_attestations table of the database. This is the information stored in the table so that the relationship can become an edge when visualised in *Gephi*:

- Sturlubók_rel_ID_1
- S_individual_ID_1
- S_individual_ID_1_name
- relationship_type
- relationship_subtype
- Old_Norse-Icelandic
- S_individual_ID_2
- S_individual_ID_2_name
- S_chapter
- date_of_entry

To demonstrate how relationships become edges the relationship between Þrasi and Þórólfr extracted from S337 will be used as an example, *Þrasi hét maðr, son Þórólfs hornabrjóts* 'There was a man called Þrasi, son of Þórólfr *hornabrjótr*'. Each interaction is given its own relationship_ID for identification which is automatically generated by Access in the 'Sturlubók_rel_ID' column in the table, C1 in Figure 11. Here the two interactions forming the relationship between Þrasi and Þórólfr are assigned the Sturlubók_rel_ID of 1 and 2. This ensures that each interaction acts independently of other relationships. This important because if Þrasi and Þórólfr are engaged in another type of relationship that is not categorised as a consanguineous kinship relationship or they are mentioned as a father-son pairing in another chapter of *S* (which they are not), these interactions can be recorded separately to reflect how they engaged with each other through the

entirety of the text (see 2.4.1). This unique ID is only used for the database, when this information is extracted and imported into *Gephi*, new IDs for each relationship are assigned, but they are still exclusive to each entry.

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
Sturlubók_rel_ID	S_individual_ID_1	S_individual_ID_1_name	relationship_type	relationship_subtype	Old_Norse	S_individual_ID_2	S_individual_ID_2_name	S_chapter	date_of_entry	notes
1	1	Þrasi	consanguineous_kinship	son	Þrasi hét maðr, son Þórólfs hornabrjóts	2	Þórólfr	337	04/04/2022	
2	2	Þórólfr	consanguineous_kinship	father	Þrasi hét maðr, son Þórólfs hornabrjóts	1	Þrasi	337	04/04/2022	

Figure 11 Sturlubók_relationship_attestations table in Access

Once the Sturlubók_rel_ID is assigned to the relationship then the 'person_ID' of one of the individuals in the relationship is entered into the 'S_individual_ID_1 column', C2 in Figure 11. The person_ID, the unique identifier for an individual, is taken from the nodes and attestations tables where it is also recorded to ensure each person is correctly attributed to each relationship (see 2.6.1.a). Þrasi's person_ID is 1 so it is entered into the 'S_individual_ID_1' for the first interaction, here 'Sturlubók_rel_ID' 1 in C1 of Figure 11, of this relationship. The ID inserted in the S_individual_ID_1 column will become the 'source' node in *Gephi*, which is the starting point of an edge. Ultimately, it does not matter if Þrasi or Þórólfr are entered as the first individual in the relationship because both of their roles are recorded as separate interactions. Therefore, they both function as 'source' and 'target' nodes in network graphs. Additionally, because these relationships are entered as undirected edges, the directionality of the relationship does not matter because two individuals are simply being connected (see 2.4.2.a.ii). So the terms 'source' and 'target' are ultimately arbitrary. To further identify who the first individual is in the relationship, their 'standard_name' is entered in C3 in the 'S_individual_ID_1_name' column and associated with the 'person_ID' column in C2. Since Þrasi is the 'standard_name' linked to the 'person_ID' of 1 in the 'S_individual_ID_1 column', it is recorded in C3.

Next the relationship type which denotes how the individuals interacted in *S* is recorded in the 'relationship_type' column, C4 in Figure 11. The best-fitting relationship type used to describe an interaction is selected from the taxonomy outlined in 2.5. Considering Þrasi and Þórólfr are related by blood, the 'consanguineous_kinship' relationship type is entered to describe their

general relationship. This column is important for visualising the different relationship types in network graphs and will be extracted alongside the ‘S_individual_ID_1’ and ‘S_individual_ID_2’ columns. To preserve the role an individual played in a relationship, it is entered into the ‘relationship_subtype’ column, C5 in Figure 11 (see 2.5.1). It is important to note that this column only corresponds for the person listed as ‘S_individual_ID_1’ in the interaction. For the next interaction, where the entries for ‘S_individual_ID_1’ and ‘S_individual_ID_2’ are swapped then the role f ‘S_individual_ID_2’ will be entered. For this entry, since Þrasi is the one entered first in the relationship and he is clearly the is the son of Þórólfr, the relationship subtype of ‘son’ is entered in C5 to indicate Þrasi’s role in the relationship.

The text where the relationship was explicitly stated or inferred from in *S* is entered in the ‘Old_Norse-Icelandic’ column, C6 in Figure 11 (see 2.4). Since the father-son relationship between Þrasi and Þórólfr was detected from the excerpt *Þrasi hét maðr, son Þórólfs hornabrjóts*, it is entered here. This step provides transparency into the data entry process for this thesis so that other ON-I scholars can use it as a starting point in thinking about how to standardise and replicate relationships using other Digital Humanities approaches. If a particular decision for recording a relationship requires more rationale, more documentation is recorded in the ‘notes’ column, C11 in Figure 11.

The ‘person_ID’ of the second individual in the relationship is entered into the ‘S_individual_ID_2’ column, C7 and their standard name is input in the ‘S_individual_ID_2_name’ column. This person functions as the ‘target’ node in *Gephi*, the person who ‘receives’ the relationship. Once again it does not matter who is entered first or who sends or receives the relationship. Þórólfr’s person_ID, 2, is entered into C7 because he is the individual identified in a relationship with Þrasi, His ‘standard_name’ is also recorded in the S_individual_ID_name_2 column, C8 in Figure 11.

The chapter where the relationship was identified is then input in the ‘S_chapter column’, C9 in Figure 11. The relationship between Þrasi and Þórólfr was identified in chapter S337 and this chapter number is entered in

C9. It is important to record the attestation of each relationship by chapter because this ensures that no relationships are recorded twice from the same chapter (see 2.4.1). Additionally, not all relationships are logged sequentially in the database because some entries might have been deleted, changed, or added throughout the data entry and data cleaning processes. This makes the chapter number alongside the 'Sturlubók_rel_ID' an effective way to associate the relationships with others in the same chapter even if they are hundreds of entries apart in the database. C1 in Figure 11. The date the relationship was entered is in C10 and any notes made into C11.

Next the second interaction of the relationship is entered in the database. The entry process is similar, but here the order of individuals is swapped to record the relationship type, or the other person and a new unique ID is generated for this interaction in 'Sturlubók_rel_ID'.

2.7 *Gephi*

The SNA software *Gephi* is used to produce network graphs in this thesis because it is user-friendly and can 'import, visualize, spatialize, filter, manipulate and export all types of networks' (Bastian et al. 2009).[47] Furthermore, *Gephi* is an 'extensive' software, it can be constantly modified to incorporate new algorithms, filters, or tools to fit the needs of the researcher conducting the analysis (ibid.). How these different features spatialise, filter, and manipulate visualisations will be discussed on a graph-by-graph basis when it is relevant to a specific case study.

Not only is *Gephi* relatively easy to use, but it also produces intuitive graphs which 'visualises "live" spatialization' (Jacomy et al. 2014, 1; see 2.2.1.a). Nodes/individuals appear in the network close to other nodes that share connections to and far from nodes they have no connections with. This positioning aids in VA and enables communities and patterns to be detected based on where nodes cluster in network graphs. Thus, the structure of the narrative network can be interpreted just by looking at it in a visual form.

[47] For more information and tutorials on *Gephi* see ('Learn How to Use Gephi', *graph exploration and manipulation*, accessed September 27, 2023, https://gephi.org/users/).

Beyond visualising the network, *Gephi* can quantify different aspects of it. For example, centrality measures can be applied to see who the most important individuals in the network are (see 5.5). Population statistics can be easily computed at network- and group-levels. There are of course limitations when using each type of algorithm, tool, or filter in *Gephi* and these will be mentioned on a case-by-case basis. Overall *Gephi*'s capabilities enhance this thesis' interdisciplinary approach by visualising the networks of *S.* And part of accepting the challenge of studying a text as complex as *S* is to try exploratory approaches. In this sense, this thesis embraces failure. Figuring out what methods and tools are not effective in studying *S* is just as impactful as finding novel ways to read the text.

III Case Study: Visualising the Narrative Structure of *Sturlubók*

One of the defining characteristics of *S* is that it is not a chronological narrative of the settlement of Iceland. Instead, it is a collection of individual settlement narratives organised to mirror the geographical layout and administrative organisation of medieval Iceland. The *fjórðungar* 'Quarters' of Iceland are used as the main textual structuring mechanism in all extant redactions of *Ldn* which help organise land-claims according to their region; however, these boundaries are not always clear. This element raises the question of how to divide the text by geographical boundaries for SNA? This is an important consideration because SNA does not work well with fuzzy concepts, concepts that lack precise, fixed meanings, but instead have multiple semantic associations depending on context (e.g. distance, age, degree of membership in a group) (Zadeh 2015, 4). Historical narratives like *S* include many of these fuzzy concepts, therefore, to construct, visualise, and manipulate graphs, inputs need to be clearly labelled and defined.

Additionally, the imposition of Quarters (c.965) on the settlement period (c.870-930) setting of *S* is anachronistic. This time discrepancy prompts inquiry into whether quartering was a natural continuation of social structures developed by the *landnámsmenn* based on imported legal systems from the homelands but amended and adapted to for self-governance by landholders living in a scattered population (Leonard 2010). In other words, do the textual divisions in *S* represent 'realistic' patterns of settlement and community building, which naturally evolve into thirteenth-century hierarchical administrative systems? Or is the structure of *S* entirely fabricated with certain families purposely attached to specific plots of land to serve as an inheritance document projecting only thirteenth-century perspectives, masquerading as a history of settlement (Sveinbjörn Rafnsson 1974, 230-1)?

3.1 The Quarters of Iceland

Before discussing how Quarters function as textual boundaries in *S*, the social, political, and geographical importance of Quarters in medieval Iceland will be examined. This background will contextualise how the organisation of *S*'s narrative networks are influenced by its unique narrative structure, which is based on geo-administrative boundaries.

With the institution of the quadrant system, the 'process of settling Iceland was, intellectually speaking, done' (Ward 2019, 131). This is because quartering-imposed boundaries facilitated the transition of Iceland from an unsettled land to a nation—or at least a cultural community resembling a nation—with a socio-political structure and collective identity. This evolution was successful because 'a Quarter could have only any meaning with reference to a whole' (Leonard 2010, 157). In other words, Quarters were socially accepted divisions across the whole island and not just regional institutions.

The Quarters of Iceland correspond to the cardinal directions—*norðr* 'north', *austr* 'east', *suðr* 'south', *vestr* 'west'. The approximate Quarter boundaries of Iceland can be seen in Figure 12, a map of Iceland after the Commonwealth with arrows depicting orientation across Quarters. The (W) signifies the Western Quarter, (N) the Northern Quarter, (E) the Eastern Quarter, and (S) the Southern Quarter. It is important to note that *þing* districts and Quarter boundaries were not demarcated by laws, but it has been suggested that these districts 'probably assumed fairly definite boundaries, which are echoed in [Iceland's] division into *sýslur* (districts) in later periods' (Gunnar Karlsson 2000, 25).

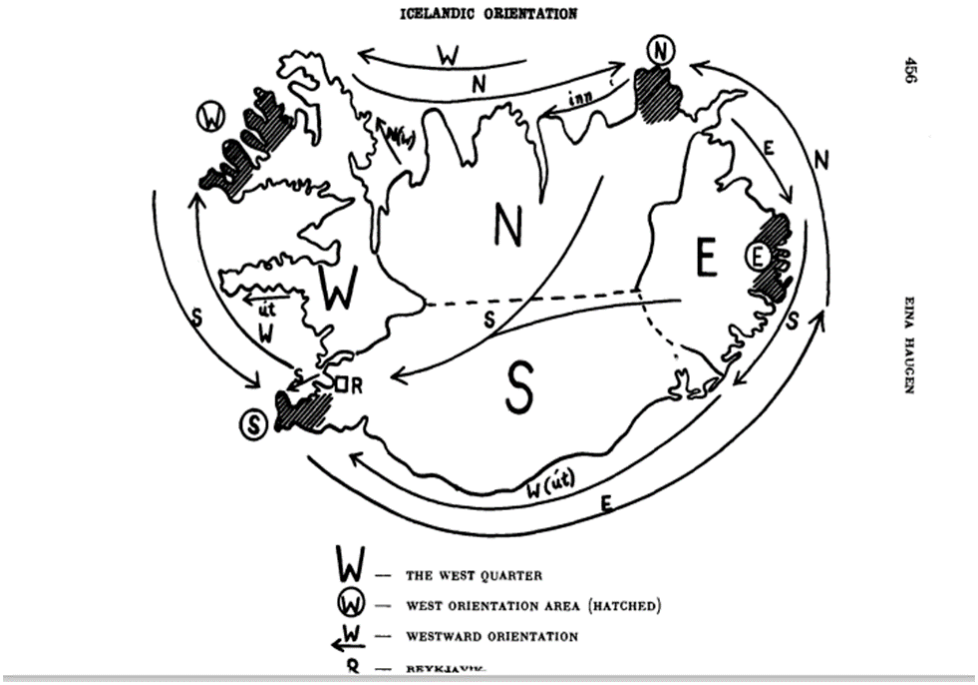


Figure 12 Map of Iceland with Quarter divisions (Haugen 1957, 456)

Quarters are not only physical regions on the landscape, but they also act as mental markers in an 'ultimate' system of direction. In this system, directions 'are described in terms of a goal (each Quarter being a goal)' and are derived from travelling around the coast of Iceland by ship and horseback (Haugen 1957, 452-54; Jackson 1998, 73). This differs from the proximate system of orientation which is ego-centric and based on an individual's visual experience on the open sea and on land 'phrases like *fyrir norðan kirkjuna*, "north of the church"', in this model directions are 'approximately correct' (Haugen 1957, 451; Hastrup 1985, 51-7; Jackson 1998, 72).[48]

Most travellers in Iceland would have followed a route parallel to the coast because settlements clustered in a 'thin line of localities around an uninhabitable central mass' (Haugen 1957, 453). In the ultimate system going 'east' from any topographical point in Iceland meant going towards the Eastern Quarter. Therefore, directions could appear to be 'incorrect' in this system because they were not based on the cardinal directions and celestial observation of the 'proximate' orientation system but are instead constructed

[48] For more on the differences between 'proximate' and 'ultimate' systems of orientation see Stefán Einarsson (1942; 1944); Haugen (1957); Hastrup (1985); and Jackson (1998).

by the society (Hastrup 1985, 55). This is especially true for intra-Quarter travel where directional terms could be used oppositionally in both 'approximately correct' and 'incorrect' senses (Stefán Einarsson 1944, 283; Hastrup 1985, 53).[49] This 'ultimate' system of orientation is illustrated in Figure 12 with arrows indicating how movement was conceptualized between Quarters. For example, if a person were to move from the Western Quarter (W) to the Northern Quarter (N) they would be headed 'north', designated by the 'N' arrow even though the 'approximately correct' direction would be 'east' because the Northern Quarter is the 'ultimate' goal.

This conceptual framework demonstrates that Quarters are socially accepted co-ordinates of space relative to the Icelandic landscape; this allows people and their relationships to not just be physically located, but also to be mapped upon the socio-cultural landscape. Therefore, a person living in Eyjafjǫrðr in the Northern Quarter is not only geographically located within space, but also culturally connected to this region as individuals from the other Quarters would have to move 'north' to visit them. This deep association between a group of individuals and their Quarter of residence is evident in terms like *Norðlendingafjórðungr* 'Quarter of the people of the Northland' and *Sunnlendingafjórðungr* 'Quarter of the people of the Southland' (*Íslb* 5; S196). The usage of these words in historical texts like *Íslb* and *S* suggests that regional associations were known by the time of the compilation of these texts. These group names could indicate that 'localizations' formed during the settlement period when kinship ties had to be reformed on a *terra nova* (Leonard 2010, 154). These elements raise the additional question of whether these localisations can be visualised in *S*? If so, are local and regional identities more important in the narrative network? Or is an overarching Icelandic identity visually detectable in the narrative network?

[49] For examples of how orientation systems work within Quarters see Haugen (1957, 452-455). Movement within Quarters and between land-claims will be explained when relevant to the analysis of the data. Here movement between Quarters is the focus.

3.2 The Narrative Structure of S: Quarters as Textual Boundaries

Quarters are not only geo-administrative divisions but are employed in *S* as an 'important cognitive and organizing tool that has real-world efficacy' by serving as textual boundaries, grouping setters and their descendants by their perceived topographical locations (Ward 2019, 131). *S* subscribes to the 'ultimate' system of orientation because its textual structure mirrors the geographical and administrative quadripartite arrangement of Iceland.

Yet like physical borders in the landscape, land-claim boundaries do not always form clear divisions in the text and the Quarter sections in *S* are not always cohesive or appear where they are expected. It is believed that the earliest versions of *Ldn* were sequenced in a manner where there is a chapter to introduce each Quarter that is followed by the land-claims of settlers associated with that quadrant (Björn M. Ólsen 1893, 349-52; 1920, 283-300). Based on the narrative structure of *M*, it appears that the border between the Southern and Eastern Quarters was somewhere between the farm Skógar and Sólheimasandr was the original starting point for *S* (AM 445 b, 4to; ÍF I liv; M1-M2; Höfig 2018, 3).[50] Sturla is aware of this boundary, and he even refers to it in *S*, *norðan til fjórðungamóts frá Langanesi á Sólheimasand* 'from the Quarter boundaries at Langanes in the north to Sólheimasand [in the south]' but he chooses not to use the boundary as the starting point for his enumeration of land-claims (S263).

In his redaction, Sturla breaks the Southern Quarter into two sections and moves the starting geographical position of the text from the South/East border to the middle of the Southern Quarter to place Ingólfr's claim first.[51] On the surface, it looks like Sturla is creating a new geographical pattern for his version of *S*. However, looking at the positioning of farms on either side of Ingólfr's claim demonstrates how Sturla managed to maintain a continuous

[50] If *M* was complete, land-claims would have continued being listed around the coast of Iceland creating an uninterrupted geographical account of settlement (ÍF I liv; Höfig 2018, 3).
[51] Ingólfr's settlement would have appeared later in *M* following the principles of the ultimate system of orientation (ÍF I lxxxii-xci; S389n4; JJóhGLdn 132).

geographical narrative of settlement even while splitting the Southern Quarter. Figure 13 is a map showing farms within Ingólfr's land-claim (S9-S19, S390-S396).[52] After detailing Ingólfr's final settlement location, Reykjavík, farms to the west of Ingólfr's claim are enumerated (S10-S19). These claims following the coast upwards from Reykjavík to Kjalarnes and into Hvalfjǫrðr and this movement is shown by the white arrows in Figure 13. Once outside of Ingólfr's settlement boundaries, the text enumerates land-claims clockwise around the coastline, first moving into the Western Quarter of Iceland, then circling around the shoreline of the Northern and Eastern Quarters and before finally returning to the Southern Quarter and the other settlers in Ingólfr's claim (JJóhGLdn 69; S390-S396). This arrangement enables the audience to position themselves within the area of the land-claim being discussed and understand its relationship relative to the whole of Iceland because the text consistently moves through the landscape like a traveller navigating along the coastline, aiming for the next Quarter.

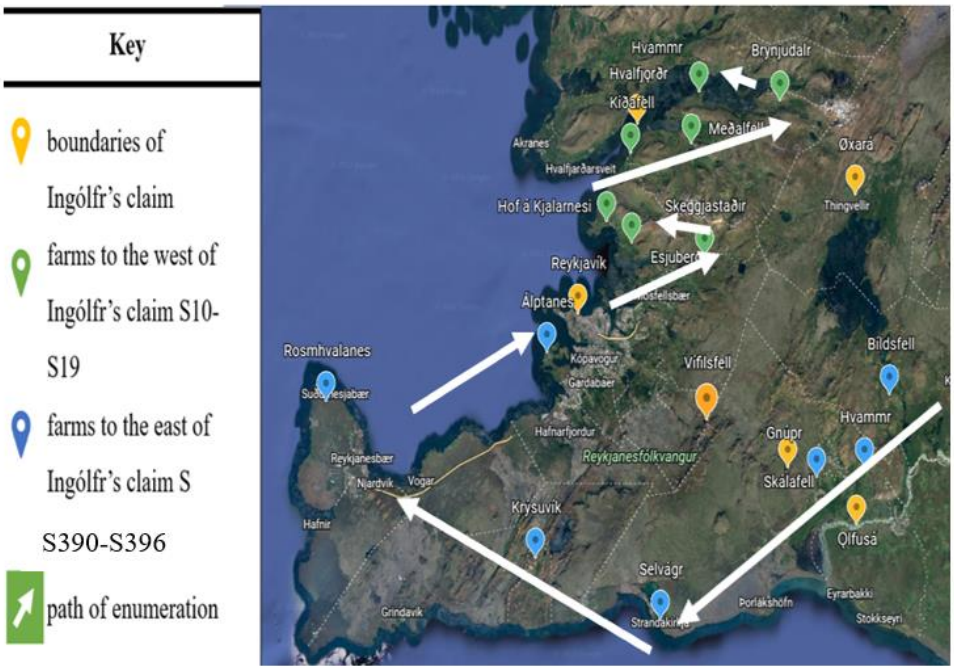


Figure 13 Map showing locations in Ingólfr's land-claim

[52] Unless otherwise stated, maps in this thesis are created using Google Earth or Google My Maps and coordinates for boundaries and farms in *S* are taken from Icelandic Saga Map (ISM). Since these coordinates are projected on modern maps, occasionally modern road numbers and locations will be shown. Additionally, farms and boundaries may not appear in their exact *landnám* locations, but these coordinates are close approximations.

3.2.1 Quarterless Areas?: What Quarters do Hvalfjǫrðr and Borgarfjǫrðr Belong to?

S's movement into the next Quarter is not always seamless, as the chapters from S20-S41 cannot be attached to any Quarter with complete certainty because they come after the western settlements of Ingólfr's land-claim, S10-S19, but before the introductory chapter of the Western Quarter, S42. There are no clear textual markers assigning them to a specific Quarter and the land-claims are situated in 'transitional' areas between the Western and Southern Quarters—Hvalfjǫrðr and Borgarfjǫrðr (Haugen 1957, 457). This uncertainty poses a problem when attempting to assign a Quarter of reference to each of these chapters. Since SNA cannot interpret fuzzy data, choices must be made on how to divide the text in a manner to generate visualisations and metrics that reflect *S*'s narrative structure as accurately as possible.

Chapters S20-S28 correspond to the northern side of Hvalfjǫrðr. Since this section directly follows Ingólfr's settlement and appears before the chapter introducing the Western Quarter, S42, individuals who are mentioned in chapters S20-S28 are attached to the Southern Quarter in the database.

3.2.1.a Skalla-Grímr's land-claim

The chapters S28-S41 are difficult to label because they are part of another narrative subunit, Skalla-Grímr's *landnám*, S29-S67. Skalla-Grímr's land-claim spans Borgarfjǫrðr, which functions as the *de facto* border between the Western and Southern Quarters. This expansion of Skalla-Grímr's land-claim is not only an attempt by Sturla to enlarge his land-claim, but also Skalla-Grímr's perceived influence in the text. According to *S*, he claimed all land from Selalón in the west, north to Borgarhraun and south to Hafnarfell with the rivers marking his claim to the sea. He named the fjord Borgarfjǫrðr and settled at the farm Borg (S29-S30). This is an interesting position for Skalla-Grímr's chapter in *S* because Borg is situated firmly within the Western Quarter and Skalla-Grímr and his lineage are linked to the West, not the South of Iceland (S170, S398).

Following the description of Skalla-Grímr's land-claim, settlements east of the Norðrá (river) are enumerated in the Southern Quarter until S42, when the Western Quarter is suddenly introduced, *Hér hefr upp landnám í Vestfirðingafjórðungi, er mart stórmenni hefir byggðan* 'Now comes the settlement of the West Quarter, where many important people have lived' (S42). It almost appears that the Western Quarter is an interruption within Skalla-Grímr's land-claim and more settlements within his property are enumerated until S67, *Nú eru þeir menn taldir, er lǫnd hafa byggt í landnámi Skalla-Gríms* 'Now we have listed all those who settled in Skalla-Grímr's land-claim'. The land-claims that are listed between S42-S67 are predominantly located west of the Norðrá.

The almost perfect geographical divide between the land-claims in Skalla-Grímr's claim that are mentioned before the Western Quarter section (dark blue) and after (light purple) is shown in Figure 14. This distribution again prompts the question of how to divide the text by geographical boundaries for SNA if the region, Borgarfjǫrðr, is perceived as an independent unit operating across Quarter boundaries in *S*.

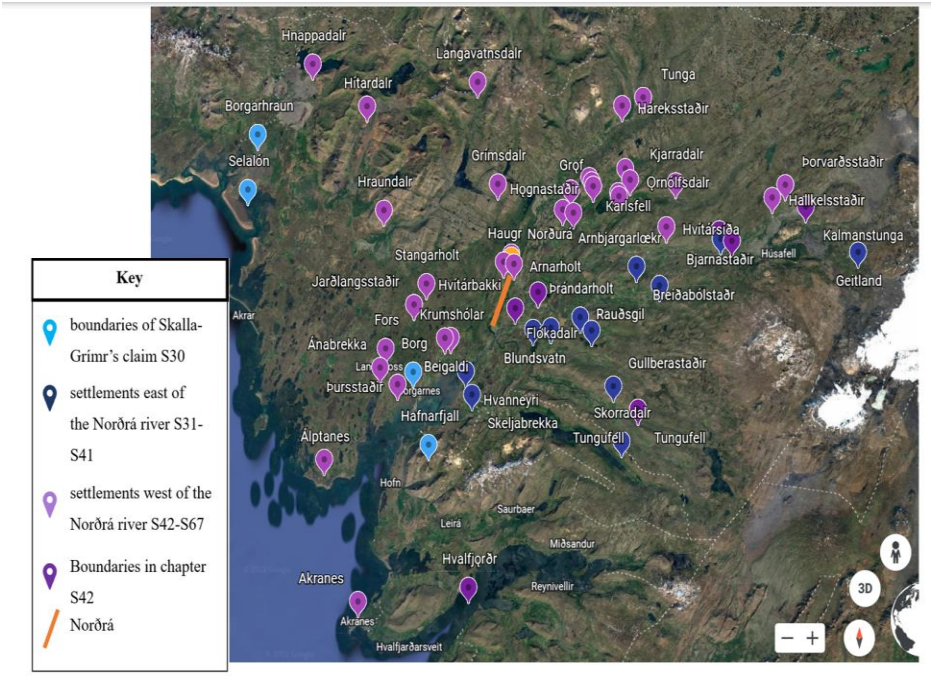


Figure 14 Locations in Skalla-Grímr's landnám

To account for the different ways the narrative structure of *S* can be divided using SNA, additional categories were added to the database. Individuals mentioned within Skalla-Grímr's land-claim, S29-S67, are given a 'yes' attribute in the column in the 'Skalla-Grímr' column in the attestation table in the database (see 2.6.1.b). If they are found in this section as well as in other chapters in the text, they are assigned a 'yes' value in the 'in_and_out_of_Skalla-Grimr' column, if they are only found in Skalla-Grímr's section or outside of his claim they are given a 'no'. Individuals who are only mentioned between S29-S67 are given a 'yes' in the 'only_Skalla_Grímr' column in the attestations table in the database. These different levels of granularity provide more insight into the composition of people who are said to live within his boundaries.

At the same time, chapters S29-S41 are considered part of the Southern Quarter because they appear in the text before the chapter introducing the Western Quarter and they are located east of the Norðrá, which if based on the ultimate system of orientation, positions these chapters in the south. Individuals mentioned within these chapters are given a 'south' attribute in the 'quarter(s)_of_reference' column in the attestation table (see below). Chapters S42-S67 of Skalla-Grímr's land-claim which cover settlements and individuals located on the north side of Borgarfjǫrðr and west of the Norðrá are classified as part of the Western Quarter because these chapters come after the opening of the Western Quarter and were considered the west during the Commonwealth.

3.2.2 Introductions and Conclusions: The Intended Layout of *Sturlubók*

3.2.2.a Introductory chapters

After the enumeration of Skalla-Grímr's settlement, *S* reverts to its intended layout following the Quarter boundaries. Each Quarter opens with an introductory chapter that orients the reader's perceptions of that region by listing that area's characteristics and then registering the land-claims belonging

to that Quarter. These 'introductory chapters' are S42, S171, S263, and S336.[53] Each of the 'introductory chapters' attempts to historicise and legitimise the enumeration of land-claims rather than establish geographical boundaries of the Quarter itself and the Eastern Quarter introductory chapter is the only one that explicitly mentions any boundary markers (S263; see 3.2). So, either the boundaries were well-established and did not need further discussion, or the boundaries were left out to allow more flexibility in terms of regional control like in the case of Skalla-Grímr's land-claim. Regardless of which is the case, Sturla attempts to frame himself as a reliable narrator, who states facts, *ok raun berr á*, about each region (S171). For the Northern Quarter, he notes that it is the setting of the greatest sagas both in the past and present, *stœrstar sǫgur hafa gǫrzk bæði at fornu ok nýju*, and that this region is the most densely populated, *Norðlendingafjórðungi, er fjǫlbyggðastr hefir verit af ǫllu Íslandi* (S171).

Yet there are some inconsistencies with the 'facts' he presents about the Northern Quarter. The internal logic of *S* does not support the Northern Quarter being the most densely populated because more individuals in *S* are associated with the Western Quarter (see 3.5). This could be a remark demonstrating that the Northern Quarter was more populated during the time of compilation than in the settlement period. After all there were more *goðar* 'chieftains' in the North than in the other Quarters (Gunnar Karlsson 2000, 25; Koszowski 2014, 340). The comment could also imply that only people of a certain status made it into *S* as population density does not necessarily equate to power as women and non-landholding individuals are often under-recorded based on population estimates of the settlement period (Jacobsen 2005). The Western Quarter 'closing chapter' also acknowledges that some forebears of leading families were left out of the text, *þótt langfeðr haldisk stœrra í sumum ættum* 'even though the ancestors were considered more important in some family-lines', which Jakob Benediktsson interprets as Sturla wondering why some ancestors

[53] 'Introductory chapters' introducing Quarters are found in *M* and *H* (M1; H30, H225, H294). Due to the few extant pages of *M* only the Southern Quarter has an introductory section, but more were likely were written. *H* does not appear to have an introductory chapter for the Eastern Quarter or have closing chapters, but the information usually found in 'closing chapters' is included in H354 (S170n3).

were not listed (S170; S170n1).Whether true, this is secondary to the compiler styling themselves as an authority who is knowledgeable and used sources to inform what he has committed to history, therefore, the land-claims recorded in *S* are valid.

3.2.2.b Closing chapters of quarters

To create more textual divisions, 'closing chapters' are also attached to each Quarter in *S*: West, S169 and S170; North, S262; East, S335; and South, S397. These chapters appear to be inserted by Sturla and likely were not found in earlier redactions (JJóhGLdn 69). In each of these chapters, the most important settlers of the Quarter are enumerated alongside a statement that validates these claims. For example, *Nú eru rituð landnám í Austfirðingafjóðungi, eptir því sem vitrir menn ok fróðir hafa sagt* 'Now the settlements in the East Quarter are written, as wise and learned men have said' (S335). This citation confirms that these settlers and their boundaries are socially accepted because they come from a distributed network of reliable sources (see 1.3.2 and 1.3.3). In other words, information about settlers and their land-claims was compiled over time by a network of contributors (saga writers/tellers/scribes), who were familiar with different regions of Iceland (Ranković 2006a, 268). Eventually these fragments of memory, which act as immanent entities within a collectively envisaged whole, would be reassembled by a compiler like Sturla Þórðarson (Clover 1984, 34). This process creates a contemporarily localised product that also speaks to the overarching conceptual framework of settlement (Ranković 2006a). Thus, by drawing upon 'wise' and 'learned' men, Sturla not only legitimises the inclusion of closing chapters in his redaction, but also the individuals who are perceived to be the most influential settlers of each region.

Sturla also infuses contemporary knowledge in the Quarter conclusions. For example, he includes the number of taxpaying farmers in the summaries of the Western and Northern Quarters, 1,080 and 1,440 respectively. However, this remark is anachronistic because these numbers were drawn up 'towards the end of the 11th century in connection with the institution of the tithe system (1097 AD)', (BoS 170n62). This demonstrates that contemporary knowledge is not perceived as incongruent to the past, but rather as an evolution. This

information speaks to the contemporary audience while also drawing upon the larger cultural framework, outside of *S.*

3.2.2.c Conclusion of Sturlubók: chapters S398 and S399

There are also two final chapters of *S* which in addition to the introductory material (S1-S5) exist outside of the quadripartite framework. These chapters list the greatest chieftains and early Christians in Iceland (S398-S399). These chapters are believed to have been added by Sturla because they are not found in the *M* redaction, they incorporate contemporaneous evidence, and link *S* to Christianity (JJóhGLdn 70-1).

S398 states that Iceland was settled within sixty years and notes that many settlers and their sons were living after the *landnámsöld*.[54] This time frame indicates that it was possible for earlier generations of oral storytellers/historians to obtain first-person accounts of settlement and that they were then able to pass this information to the following generations. As a compiler, Sturla is a part of this distributed network of scholars and as such he can make informed changes to *Ldn* because he is not only relying on his personal knowledge, but also that of *fróðir* 'knowing, learned, well-informed' and *vitir* 'wise' men (ONP). Of course, Sturla still influences the text to favour his lineage like when expanding the land-claims of Skalla-Grímr and achieve his contemporary goals (see 3.2.1.a). The rest of S398 lists the greatest *hǫfðingjar* 'chieftains' from each Quarter who lived sixty years after settlement, *í Sunnlendingafjórðungi, í Vestfirðingafjórðungi…en norðr…í Austfjórðungi* 'in the South Quarter…in the West Quarter…in the North [Quarter]...in the East Quarter (S398).[55] This list also demonstrates that although an overarching Icelandic identity exists during the period of compilation regional associations are still contemporary concerns.

The final chapter of *S* lists the early Christian settlers of Iceland. The island was pagan during the settlement period, but *S* was written in a Christian

[54] *at landit yrði albyggt á sex tigum vetra, svá at eigi hefir síðan orðit fjǫlbyggðra; þá lifðu enn margir landnámsmenn ok synir þeira* (S398).
[55] Here the list starts with the Southern Quarter instead of the Western Quarter this also indicates that Ingólfr's land-claim was split (see 3.2).

context. By establishing that these individuals are Christian before the conversion of Iceland c.1000, Sturla creates a link between these disparate religious contexts (JJóhGLdn 70, see 5.5.3.b.i.1). This connection alongside his employment of 'noble heathens', individuals like Ingólfr who espouse Christian ideals but are pagan, helps justify Iceland's pagan past and bring 'it into concordance with the values of their own time' (Lönnroth 1969, 28; see also Höfig 2018). Since these final two chapters are distinct in content from the rest of the text they are treated as their own unit in this study, named 'Conclusion' which contains S398-S399.

3.3 Quarters as Narrative Units for Social Network Analysis

To explore the geo-political narrative structure of *S* from a socio-network-theoretical perspective six narrative units have been created based on the textual divisions in *S*. These units are: Introduction (S1-S5), Western Quarter (S42-S170), Northern Quarter (S171-S262), Eastern Quarter (S263-S335), Southern Quarter (S6-S41 and S336-397), and Conclusion (S398-S399).[56] These units help the network emulate the structure of *S* in visualisations, and since these textual divisions are based on the actual topography and administrative divisions in medieval Iceland, the narrative units also provide insight into how individuals form regional sub-communities in the narrative network.

Individuals are attached to a narrative unit corresponding to their references in the text. For example, since Þórólfr is mentioned in S339, he is given the label 'south' in the 'Quarter(s)_of_Reference' column in the attestation table of the database (see 2.6.1.b). If a person is mentioned in multiple narrative units, all units that they appear are input into the

[56] Henceforth, the term 'Quarters' is used interchangeably with 'narrative units'. In this usage 'Quarters' also includes the Introduction and Conclusion sections because they contain a minimal amount of people. However, when relevant to discussion, these are mentioned separately. Chapters S6-S10 could also be conceptualised as part of the Introduction section because they mainly describe Ingólfr's settlement and Bjǫrn *buna*'s descendants. Here, they are part of the Southern Quarter section because of this connection to Ingólfr, who is strongly associated with the south and his land-claim narrative marks the beginning of permanent settlement in Iceland according to *S*.

‘Quarter(s)_of_Reference’ column e.g. Náttfari is mentioned in S4 and S247, therefore, he is assigned a value of ‘intro, north’.

This approach allows the Quarters to be considered as not only physical entities, but also as conceptual networks. Since individuals are affixed to their respective Quarter(s), network graphs can emulate where people are conceptually and geographically located in the Icelandic landscape because nodes appear in visualisations near other nodes who are associated with the same regions (see 3.5). This enables subcommunities to be detected in the network which reflect how people were perceived to be grouped in *S*, which in turn may represent how thirteenth-century Icelanders viewed their ancestors and their contemporary communities.

Not all individuals who are mentioned within a specific narrative unit lived in that Quarter, but there is a high probability that they did. Disentangling every individual to place them within the ‘correct’ Quarter is an exercise in futility because there are too many individuals with unknown exact residences. Nevertheless, using this general method sheds light on where people were perceived to be interacting, even if they did not live in their Quarter of reference. For instance, there are several individuals who remain in the homelands King Haraldr of Norway, who still interact with individuals in Iceland as evidenced by his attestations in the introduction and in all four Quarter sections of *S.* This demonstrates that he is not only an important figure on an Iceland-wide scale but is also an actor in regional subcommunities. Including him in the network provides insight into if he was perceived similarly across Iceland or if different Quarter communities responded to his influence differently based on their relationships with him.

3.3.1 Narrative Subunits

The narrative structure of *S* can be further divided into subunits to look at different aspects of the composition of the text. Three narrative subunits have been identified to aid in exploring the textual arrangement of *S*. Theoretically, any arbitrary textual boundaries could be created to examine with SNA, but selecting a random assortment of chapters does not add any value to better

understanding how *S* was organised. Therefore, subunits are created based on clear textual markers.

Two narrative subunits titled 'Ingólfr's_land_claim' and 'Skalla-Grímr's_land-claim' are based on the boundaries of these two settler's land-claims. Ingólfr's claim is identified as chapters S6-S19 and S390-S396, and Skalla-Grímr's land-claim is S29-S67 (see above). Analysing people who are associated with these areas provides insight into how power was developed in the *landnám* according to *S* (see 5.3.1.c.iii).

Kolskeggr's narrative subunit spans from S288-S335 and is the focus of the Case Study: A Social Network Analysis of Kolskeggr's Contribution in *Sturlubók* and will be discussed in this section (see IV).[57]

3.4 Positioning of the Quarters: Visual Analysis of the Structure of Sturlubók

Figure 15 shows individuals by their narrative unit(s) of appearance. The overall organisation of the network graph emulates the textual and geographical structure of *S* with four distinct regions emerging. These sections each represent one of the Quarters of Iceland and their position in Figure 15 mimics the learned cultural behaviour of clockwise movement around the Icelandic landscape and circumambulatory patterns saturated throughout *S* (Ward 2019, 138-9).

[57] Chapters S288-S335 are considered Kolskeggr's unit based on internal evidence in *S* i.e. the stylistic distinctiveness of these chapters. For more discussion see IV.

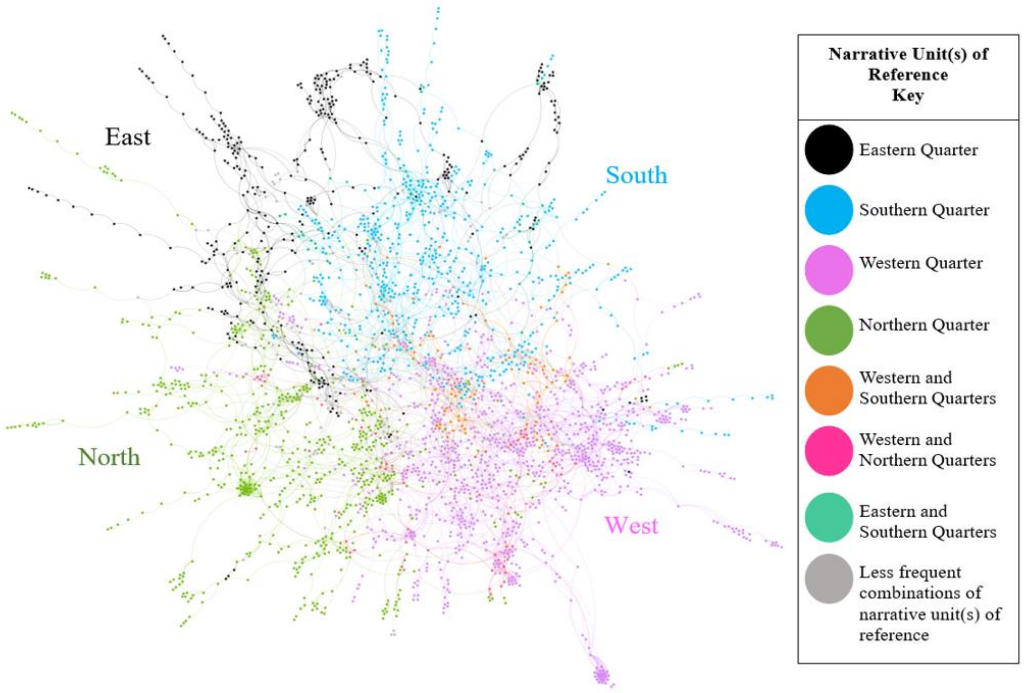


Figure 15 Network graph with nodes recoloured by narrative unit(s) of appearance

Starting from the Western Quarter on the bottom right side of the network graph, the next cluster is the Northern Quarter, followed by the Eastern Quarter and finally the Southern Quarter. Each Quarter appears in its expected place next to its directional neighbours following the layout of a compass rose. The final position of each Quarter is impacted by its strength of relationships and physical location relative to other clusters of nodes. In other words, individuals in *S* form relationships with individuals associated with the same Quarter, and the nodes of these individuals will be pulled towards each other in the network graph. Taken *en masse* these relationships begin forming communities—Quarters—which are either 'attracted' or 'repulsed' from each other based on how their populations socially interact in the text.

Therefore, the general pattern found in network graphs like Figure 15 is that groups of individuals who are associated with bordering Quarters like the North and West will more likely be 'attracted' to each other and appear closer to each other in visualisations (see 3.4.1). Individuals associated with opposing Quarters like the West and East are pushed away or 'repulsed' from each other, which suggests that there is little interaction between these regions (see 3.4.2). Thus, the distribution of Quarter communities in Figure 15 shows that

geography is not only the main organising agent of the narrative, but also its networks because it 'is perhaps the most basic source of homophily is space: we are more likely to have contact with those who are closer to us in geographic location than those who are distant' (McPherson et al. 2001, 429).[58]

3.4.1 The Pull of Geography

3.4.1.a Intra-Quarter connections

The influence that geography has on clustering individuals in network graphs of *S*'s narrative structure is compounded when the individuals are connected via consanguineal and/or affinal ties. This pattern can be clearly seen when looking at how people relate to others within a Quarter.

Many settlers migrated to Iceland with retinues comprised of family members, friends, and acquaintances. For example, Þórðr *knappr* came to Iceland with Nafar-Helgi, *Þórðr knappr hét maðr sygnskr, son Bjarnar at Haugi, annarr hét Nafar-Helgi; þeir fóru samskipa til Íslands ok komu við Haganes* (S211). Considering that both men are *sygnir* 'from Sogn [Norway]' and that they emigrated on the same ship, it can be assumed that they established some sort of bond in Norway and that their emigration was premeditated. Their relationship also appears to influence where they settle in Haganes, in the Northern Quarter. The men claim neighbouring farms with Þórðr at Knappstaðir and Nafar-Helgi at Grindill. These locations are shown in Figure 16. However, since their relationship is removed from its original context—Norway, it cannot retain its initial form and must be reconfigured and renegotiated to fit the new geo-political situation in Iceland.

[58] Homophily is the principle that contact between similar people occurs at higher rates than dissimilar individuals (McPherson et al. 2001, 416).



Figure 16 Map with locations associated with Nafar-Helgi, Þórðr and their descendants

Even if Þórðr and Nafar-Helgi settle near other individuals that they knew from Norway and continue to have a strong relationship in Iceland, these pre-established social networks are superseded by more contemporaneous regional commitments after a few generations. This phenomenon can be seen when looking at where Þórðr and Nafar-Helgi's nodes are positioned in the network relative to the positions of their descendants' nodes (see also 3.4.2).

The positions of Nafar-Helgi's descendants' nodes in Figure 17 relative to Þórðr's descendants' nodes demonstrate how geography surpasses kinship relationships as the main organising agent of *S*'s narrative structure. Initially, Nafar-Helgi's and Þórðr's nodes are somewhat close to each other in the network because they have a relationship that pre-dates their arrival in Iceland. However, after they settle, their family units appear to stop interacting and start associating with different groups of people who are based in different areas of the Northern Quarter. Of course, it is difficult to say if Þórðr and Nafar-Helgi maintained relationships in Iceland because there is no textual evidence supporting that their families were connected after their settlement. But what can be ascertained is that their descendants were interacting in different ways, and this is demonstrated in Figure 17. In Figure 17, the nodes of Nafar-Helgi's kin and those of Þórðar's descendants are being pulled in different directions as indicated by the orange arrows (see force-directed algorithms in 2.2.1.a). This is because even though each group married into and engaged with other families largely based in the Northern Quarter, they were interacting in different geographical locations in the north.

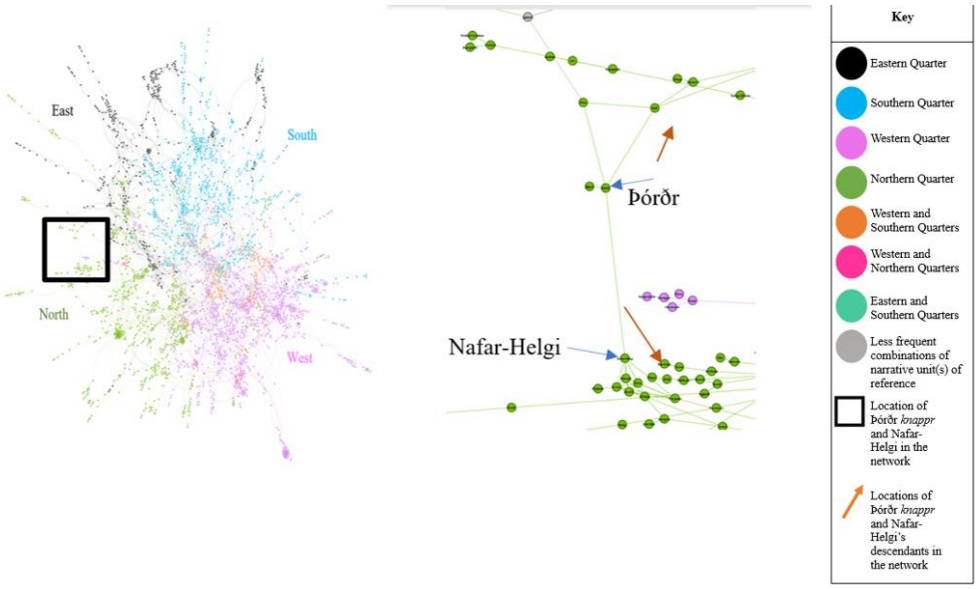


Figure 17 Locations of Nafar-Helgi and Þórðr's nodes in the narrative network

Þórðr marries Æsa, the daughter of Ljótólfr *goði* of Svarfaðardalr. Their son, Hafr, marries Þuríðr, the daughter of Þorkell of Goðdalir. Therefore, Þórðr and his descendants seek to create and maintain relationships in Haganes as shown in Figure 16. On the other hand, Nafar-Helgi's descendants' connections and exploits are not restricted to the peninsula. His son, Arnórr, fought a man named Friðleifr at Stafshólt. Nafar-Helgi's daughter, Úlfhildr, married Arnórr of Gǫnguskarð, which is on the northeastern coast of Iceland and far from Grindill. Úlfhildr and Arnórr's son was Þorgeirr *ofláti*, who killed Blót-Már at Móberg.

This difference of geographical spread between these two lineages raise multiple questions: Was there a power differential between Þórðr and Nafar-Helgi? Does Þórðr's lineage's minimal geographical spread indicate that more people wanted to be associated with his farm than Nafar-Helgi's? Or does Nafar-Helgi's progenies' Quarter-wide exploits suggest that his family had a wider influence over the north? Alternatively, were the brothers working together, with one ensuring that they maintained control of the peninsula and the other spreading their kin's influence throughout the Quarter? Answering these questions is outside of the present scope of this thesis, but this example demonstrates that pre-existing relationships like that of Þórðr and Nafar-

Helgi's are useful for initial stages of migration and settlement, but their importance fades in the narrative network.

When settlers arrive in Iceland, their consanguineous and affinal ties become mere replicas of their former selves because they are removed from their original networks. The networks of *landnám* Iceland can never be copies of those of pre-established social hierarchies—even when compiled in different redactions of *Ldn*—because some individuals chose to stay in the homelands, others who do settle in Iceland might not know their new neighbours, and if they did know their neighbours from previous networks they are now operating in a new geo-social landscape. Therefore, geography quickly becomes the main organising agent of settlement communities in Iceland because it is human nature to connect with individuals who live nearby regardless of if they are known entities or new neighbours (McPherson et al. 2001, 429).

3.4.1.b Bordering Quarters (West and South)

The Western and Southern Quarter narrative units visualise next to each other on Figure 15. This arrangement is unsurprising because these quarter units are not only next to each other in the text, but they are also neighbours in the physical landscape. The interconnectedness of these regions is further evidenced by the region of orange nodes in Figure 15 (see also area in black box in Figure 19). If an individual is represented by an orange node, it means that they are referenced in both the Western and Southern Quarter sections. This suggests that many people serve as bridges, intermediaries between the two Quarters.

An example of one of these intermediaries is Bjǫrn *gullberi*, who lived at Gullberastaðir in Borgarfjǫrðr, an area between the Western and Southern Quarters (see 3.2.1). His son, Svarthǫfði, also lived nearby at Reyðarfjall. Bjǫrn and Svarthǫfði are mentioned in both the Western and Southern Quarter sections of *S* because Þordís, the daughter of Svarthǫfði, married Guðlaugr *enn auðgi*, who lived at Borgarholt in the Western Quarter (S32-S33, S70-S71). The locations of these farms are represented by the purple markers in Figure 18.

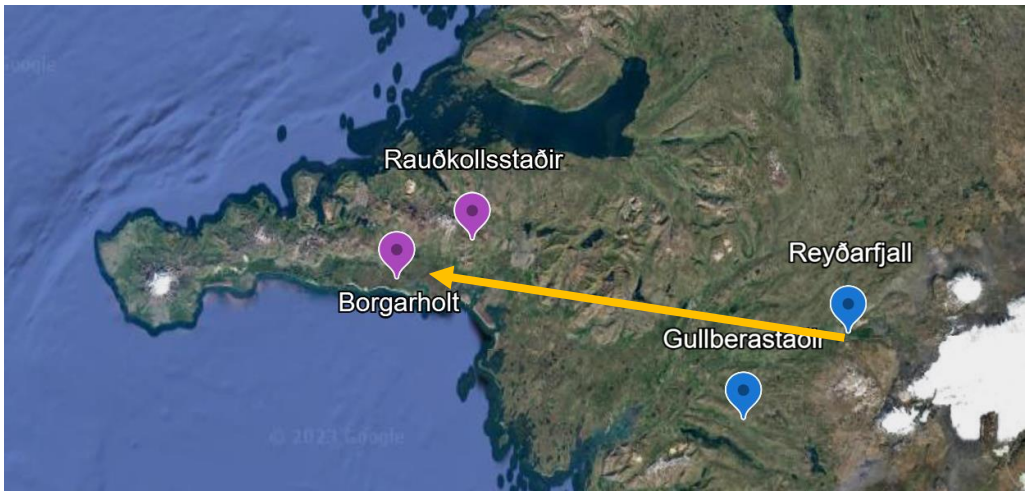


Figure 18 Map showing locations associated with Bjorn, Svarthǫfði, and Guðlaugr

Figure 19 is a magnified image of the network graph showing where Bjǫrn, Svarthǫfði, Þórdís, and Guðlaugr are positioned. Their nodes are surrounded by light blue nodes (Southern Quarter) and pink nodes (Western Quarter). Bjǫrn's node is closer to the Southern Quarter region of the graph because outside of his granddaughter's marriage, he is not directly involved in any other relationships with people from the west. Yet, he is always inserted in genealogies as Þordís' grandfather whenever her marriage to Guðlaugr is mentioned (even in the Western Quarter section). His inclusion in the Southern Quarter area of the text, a region in which he did not live, thus appears to be intentional to highlight the connection between these families.

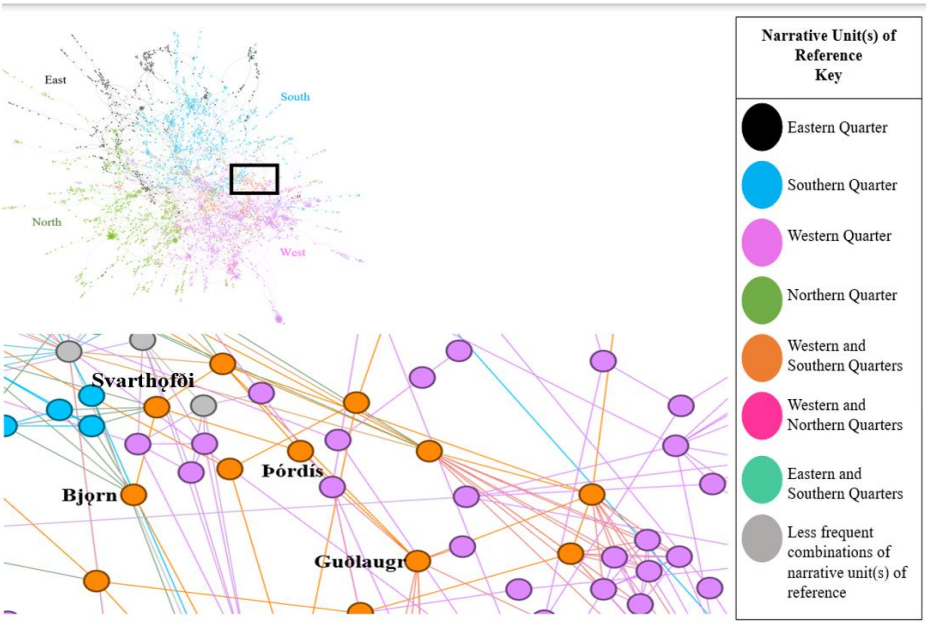


Figure 19 Bjǫrn, Þórdís, and Guðlaugr's node in narrative network graph

Þórdís' node is equidistant between the Western and Southern Quarters in Figure 19. This is attributed to her role as a wife because she would have physically relocated from her natal home in the South, Reyðarfjall, to her marital farm in the West, Borgarholt (see 6.5). This movement is represented by the yellow arrow in Figure 18. Her node's location in the network indicates that she operates as a bridge, connecting the two families and by proxy linking the western and southern regions in the network.

Þórdís' husband, Guðlaugr is entrenched within an area of pink nodes. His position in the network indicates that he firmly belongs to the Western Quarter and historically his family has connections to this region. Guðlaugr's father, Þormóðr, and uncle, Þórðr, claimed Rauðkollsstaðir (Figure 18). Furthermore, Guðlaugr is considered the progenitor of the Straumfirðingar line (S70-S71).

This pattern demonstrates how individuals can foster relations across Quarters and in some transitional areas like Borgarfjǫrðr where physical boundaries are more amorphous. These relationships not only pull kin groups from bordering Quarter closer to each other on the network, but *en masse* they also help attract each Quarter region next to its textual and geographical neighbours in the network. This demonstrates that SNA effectively emulates the narrative structure of *S* because nodes in its network graphs cluster together and operate similarly to how individuals would form communities in the Icelandic landscape during the *landnám*.

3.4.2 The Push of Geography: A Tale of Four Brothers

If physical proximity in the Icelandic landscape is the largest indicator of which nodes are likely to appear near each other in network graphs, it stands to reason that people who live far away from each other will materialise in opposite areas in visualisations. To explore how physical distance influences the position of nodes in *S*'s narrative network, the lineages of four brothers—who are also *landnámsmenn*—Lýtingr, Þorsteinn *torfi*, Vetrliði, and Þorbjǫrn—are discussed. This group has been selected because three of the brothers,

Lýtingr, Þorsteinn, and Vetrliði, settle in the Eastern Quarter, whereas Þorbjǫrn settles in the Western Quarter.

3.4.2.a Land-claims of Lýtingr, Þorsteinn torfi, Vetrliði, and Þorbjǫrn

Lýtingr arrives in Iceland with his brother Þorsteinn *torfi*. He claims all Vopnafjǫrðr, settles at Krossavík, and becomes the progenitor of the *Vápnfirðingr* 'people of Vopnafjǫrðr' (S271).

Þorsteinn *torfi*, claims all Hlíð and establishes a farm at Fossvellir (S273). This location presumably stays in the family for generations because his great-great-grandson, Hrappr, is still associated with Fossvellir, the blue marker in Figure 20. Þorsteinn's references in *S* are restricted to the Eastern Quarter narrative unit.

Another brother, Vetrliði also settles in the Eastern Quarter claiming Borgarfjǫrðr (*eystri*) (S286). There is no indication that he emigrates to Iceland with his brothers, but it is reasonable to assume that he was aware of where they settled and chose to establish a farm nearby. None of his descendants are mentioned, but Vetrliði's land-claim is the only chapter where all four brothers are mentioned together *Vetrliði hét maðr, son Arnbjarnar Ólafsonar langháls, bróðir þeira Lýtings, Þorsteins torfa ok Þorbjarnar í Arnarholti.* In this excerpt, the fourth brother, Þorbjǫrn, is linked to Arnarholt, which is interesting because Arnarholt is in the Western Quarter. The physical distance between Þorbjǫrn and his brothers can be seen in Figure 20.

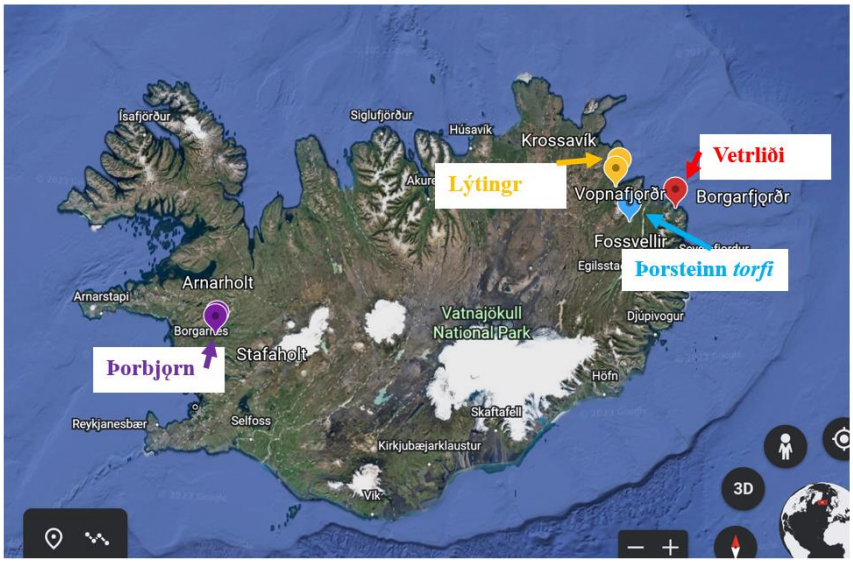


Figure 20 Map of Lýtingr, Þorsteinn torfi, Vetrliði, and Þorbjǫrn's farms

Þorbjǫrn's land-claim in Stafaholtstunga, S50, is recounted in a different narrative unit, the Western Quarter, than his brothers whose land-claims are recorded in the Eastern Quarter (S271, S273, S286). Therefore, Þorbjǫrn is not only physically distant from his brothers, but also conceptually distant because he is mentally associated with another region of Iceland. However, links can be made between the two disparate regions and the brothers through cross-Quarter references and via their father Arnbjǫrn, who is referenced in both the Eastern and Western Quarter sections (S50, S270, and S286).[59]

One of Þorbjǫrn's brothers, Lýtingr, is mentioned in S50 and is associated with the Vopnafjǫrðr; however, his farm, Krossavík is not named. Þorbjǫrn's other brothers, Þorsteinn and Vetrliði, are not mentioned in S50. This is curious because when Þorbjǫrn is mentioned in the Eastern Quarter narrative unit, it is in Vetrliði's land-claim, S286, not in Lýtingr's, S271. These discrepancies in recording suggest that the settlement narratives of these men were either remembered and recorded differently in each of the Quarters, or that each *landnám* was carefully crafted to mention the specific brothers needed to fulfil some unspecified contemporary social or political goal. Initial evidence points to the latter because when threaded together all their land-

[59] There is no indication in *S* that Arnbjǫrn settled in Iceland (S50, S270, S286).

claims create a cohesive story and there are no notable inconsistencies in their genealogies or land-claim boundaries. Thus, what can be said with some certainty is that Sturla was familiar with the brothers' land-claims—whether from his own personal knowledge or derived from another source—and that he reworked these narratives to fit within the structure of his redaction. Sturla's conscientiousness of how his redaction is not only sequenced, but also works within the conceptual framework of settlement is probably why Lýtingr—not Þorstein or Vetrliði—is mentioned in the west. His descendants are the main figures of *Vápnfirðinga saga*, therefore, Lýtingr is an effective figure of memory to preserve the historical link between these families based in opposing Quarters because over time these ties would probably weaken (S271n3; ÍF XI).

It could also be suggested that Sturla, Snorri, Ari, or another contributor created these ties to serve a contemporary purpose. Considering that Snorri wrestled for control over Stafaholt in the thirteenth century, he and Sturla would have been intimately familiar with the history of the area and may have wanted to present its settlement in a particular manner (Wanner 2008, 23). However, fully detangling the literary and historical background of this east-west relationship is outside of the scope of this thesis and the focus will return to showing how geography influences the interactions between individuals in *S*.

3.4.2.b Lýtingr, Þorsteinn torfi, Vetrliði, and Þorbjǫrn in the narrative network

Figure 21 is a network graph showing where Lýtingr, Þorsteinn *torfi*, Vetrliði, and Þorbjǫrn's appear in the narrative network. Although they are initially clustered together suggesting that they were conceptualised as a close-knit kin group, their lineages quickly spread apart in the network, which reflects the physical and social distance between their descendants in the text and in the landscape.

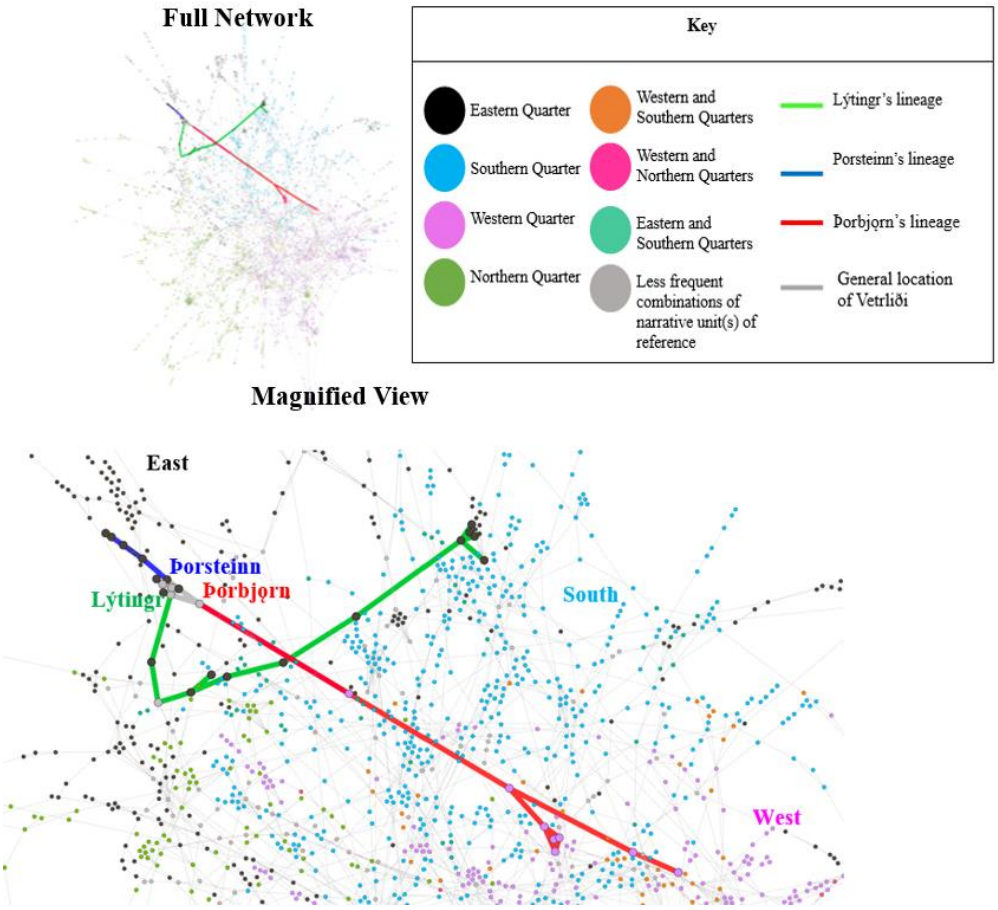


Figure 21 Locations of Lýtingr, Þorsteinn torfi, Vetrliði, and Þorbjǫrn's in the narrative network

It is important to note that Vetrliði is not included in this discussion because he has no named descendants, but he is approximately where there are grey edges in Figure 21. Of the other brothers, Þorsteinn's lineage is markedly shorter and remains near his node. This is unsurprising because as mentioned his great-great-grandson, Hrappr, is associated with his farm. This indicates that his descendants stayed in the area for generations after his settlement and/or they did not form enough relationships in the text with individuals outside their kin group to pull the nodes of this line towards other regions of the graph.

Lýtingr's lineage quickly moves towards the area of the graph where the Eastern and Northern Quarters meet. This is because Lýtingr's grandson, Bjarni, marries Rannveig, daughter of Eiríkr *í Goðdǫlum* 'of the Goðdales', from the North of Iceland (S195, S270). Lýtingr's line of descent is eventually pulled closer to the South Quarter in the graph because his great-grandson,

Skegg-Broddi marries Guðrún, daughter of Þórarinn *sælingr* who has familial origins in the Southern Quarter. As Lýtingr's lineage descends, it relocates within the network pulled in different locations of network where the families his descendants marry into are based both in the graph and in the landscape. This raises a question which is outside the scope of this thesis, but worth mentioning that is why is Lýtingr's lineage is so reactive to marriages and new relationships when presumably his family should have minimal movement on the landscape because they are historically linked to Vopnafjǫrðr?

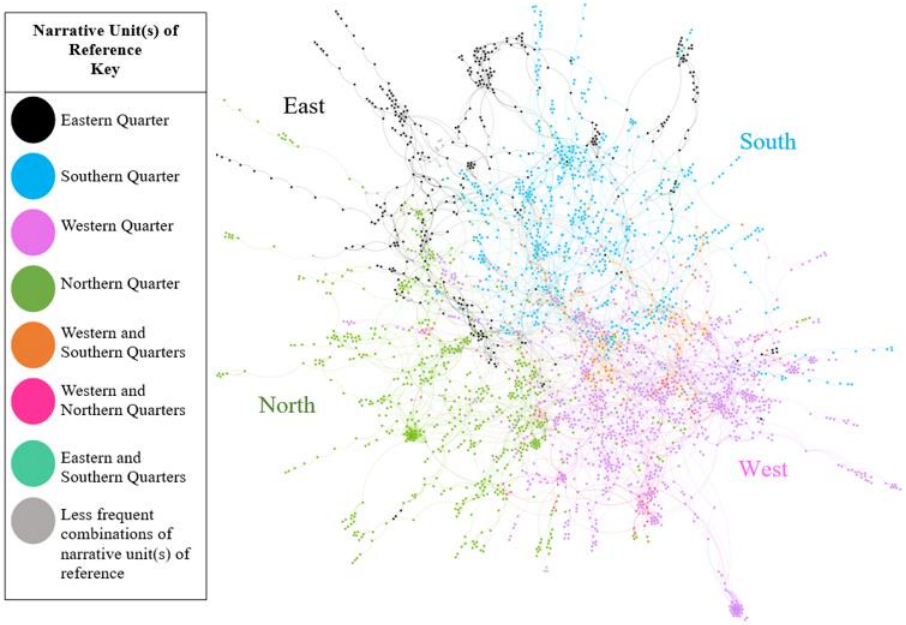
Instead of moving around the graph, Þorbjǫrn's lineage immediately descends towards the Western Quarter because his descendants are only mentioned in this narrative unit. His son, Teitr, lives at Stafaholt, the neighbouring farm of Arnarholt, and Þorbjǫrn's grandson, Einarr also farms at Stafaholt (S76, S152). This pattern is an extreme example of how geographical relationships formed during the settlement period can supersede familial ties.

Þorbjǫrn will always be historically and genealogically linked to his brothers, but new geographical boundaries mean these relationships are reconceptualised. Þorbjǫrn's land-claim narrative can only be alluded to, not described, in his brother's land-claims and vice versa simply because he does not settle in the region and it would be considered irrelevant material. Yet, the simple mention of his farm-name Arnaholt serves as a reference point to help the audience not only find this location in the text, but also conceptually locate this farm in the west in their mental map of Iceland. This is because *S* is organised geographically, not genealogically, and each brother's land-claim is sequenced in the text based on where they settle, not how they are related. Genealogies are arranged around the landscape because mountains and valleys are not only natural boundaries, but also figures of memory, which are more fixed than people who can move across the landscape. Many times, there is strong almost inseparable connection between kinship and geography like three of the four brothers settling in the same vicinity. However, when one brother sets out to settle on his own, the impact of geography becomes clearer as their kinship ties start moving in different directions of the narrative network, which could be a result of natural settlement patterns or indicate that a connection has been added by a compiler.

3.5 Visual Shape and Density of the Quarter Regions and Narrative Network: Are Quarters Clusters?

Network density is 'the proportion of possible ties that are present' (Faust 2006, 193n2). In other words, it determines the maximum number of potential relationships between individuals in the network/region against the realised relationships. The density of a network or cluster 'points to the interconnectedness of actors, telling us something about how "busy" a particular aspect of the network is' (Decuypere 2020, 84).

A cluster is considered ‘tight’ when it contains many edges and ‘loose’ when there are only a few individuals connected by a small number of edges. Looking at Figure 22, the Western region is the densest and most interconnected unit (see 2.2.1 esp. 2.2.1.a). Visually, it is the most tightly clustered Quarter because the nodes in the West are physically closer to each other than the nodes found in the other Quarters. This pattern suggests that it is easier for individuals associated with the Western Quarter to reach one another in the narrative network. If the narrative network reflects some characteristics of medieval Icelandic social networks, it also implies that it would be easier to make connections and transmit information to one another in the West than in other regions of Iceland. This would also be beneficial for contemporary descendants because would facilitate creating links between desired ancestors mentioned in *S*.



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Figure 22 Reproduction of Figure 15

The Southern and Northern Quarters have a similar shape to the Western Quarter, but they have a wider spread in the graph and their nodes are farther apart from each other, indicating that they are less dense and not as well interconnected as the Western Quarter. Each of these Quarters also have more structural holes, gaps between two nodes with complementary information than

the Western Quarter.[60] This implies that the subcommunities, intra-densely connected groups of two or more nodes that are not as well-connected to other units, making up these narrative units are smaller and more fragmented (see below). The positive aspect of having a lower density than the Western Quarter, is that when new individuals bridge structural holes there is an influx of new opportunities and information.

The most visually distinct Quarter is the Eastern Quarter. Unlike the other Quarters that are more compact, this region appears almost like a thin line circling the periphery of the graph. The composition of the Eastern Quarter is sparse and comprised of many small subcommunities i.e. independent family groups or geographically isolated groups, which are so disconnected from the main subcomponent that could not fit in the image of Figure 22 (see 4.4.1). This shows that the Eastern Quarter is not as well connected as the other three clusters. The distinctiveness of the Eastern Quarter is further discussed in the case study on Kolskeggr, who is said to have contributed most information on the relationships in this area (see IV).

Density in *S* could be impacted by source bias because more individuals documented from a particular region leads to more relationships recorded for that Quarter. However, this is of interest because whatever is documented will undoubtably influence the contemporary audience's perceptions of the *landnám* and this could have been an intentional ploy to get them to believe that the Western Quarter of Iceland was/is the most well-connected region. This matters because the past could be used to justify contemporary socio-political positions i.e. who is in power or who currently owns a land-claim.

Normally, having high density in a network is a positive attribute because people are well-connected, but in some cases having a high density can be a disadvantage. For example, high density networks can hinder the speed of decision-making in a community. This is because more individuals would need to mobilise and come to a consensus before a particular activity can be performed (Decuypere 2020, 84). Additionally high-density networks

[60] See Burt (1995; 2004) for more on structural holes.

eventually stagnate because they have less access to new information and ideas coming from individuals outside of their cluster (Hansen 1999; Dombrow and Higgins, 2005). Nevertheless, the Quarter clusters in Figure 22 and the overarching narrative network of *S* all having a relatively high density is a largely positive attribute. This is because more connections within a particular area means more opportunities to manipulate genealogies to meet contemporary political and social goals.

Partitioning individuals by their narrative units of appearance is, therefore, an effective way to not only identify social groups in the text, but to also shed light how they operate as subcommunities in the text. However, can these groups be considered 'clusters' in a network theoretical sense? If so, what are the implications?

3.5.1 Defining Clusters

A cursory glance at Figure 22 suggests that the Northern, Eastern, Southern, and Western regions on the graph act as clusters.[61] Previously, this term has been used interchangeably with area, region, etc.; however, in network-theoretical terminology 'clusters', also known as communities, are generally defined as collections of individuals with dense connections internally and sparse interactions outside of their groupings (Cormack 1971; Mishra et al. 2007, 56; Hoffman et al. 2018, 57). Clustering while 'intuitive, at first sight, is actually not well-defined' and there are several definitions for the concept and interpretations of what constitutes a cluster (Fortunato 2010, 82-3). Girvan and Newman (2002, 7821) more narrowly define clustering, or network transitivity, as the property where 'two [nodes] that are both neighbors of the same third [node] have a heightened probability of also being neighbors of one another' (see 3.5 and 6.4.2).[62] For instance, if a man named Þorgeirr is located near Loðmundr in a network graph and another individual called Helgi is also visualised near Loðmundr then it is likely that Helgi and Þorgeirr are also

[61] Regions are relatively bounded spaces on network graphs which are comprised of a set of nodes who closely engage with each other. For simplicity, the terms region and cluster are used interchangeably, see Decuypere (2020) for more on regions.
[62] Girvan and Newman (2002, 7821) use the term 'community structure' for the more general definition of clustering. To reduce confusion, these terms are used interchangeably.

neighbours. For simplicity, the definition of clustering used in this thesis encompasses the properties of dense internal connections, few external relationships outside of the cluster, and network transitivity.

Although there are four well-defined regions that visualise in Figure 23 (right), these areas are still connected to each other and the overall network is cohesive and difficult to separate. If the Quarters functioned as completely independent units, it would be expected that these regions would detach from each other and appear further apart on the visualisation. For example, Figure 23 (left) is an image of a network comprised of strong clusters which have denser node-node connections (circles with solid black lines) within each subnetwork and have weaker, less-dense connections with other subnetworks, which is shown by the lighter, longer grey lines.[63] Additionally, these clusters are surrounded by 'structural holes' where there is a lack of direct contact between individuals or groups in a network (Burt 1995).

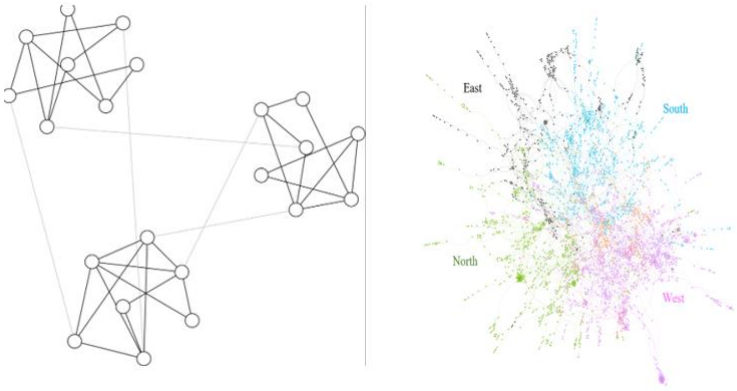


Figure 23 A graph with high levels of clustering (left) (Girvan and Newman 2002, 7822), Sturlubók's narrative network (right)

In the strictest network-theoretical sense of the definition, Quarters do not function as clusters because they are parts of a whole—both in *S* and in the landscape (Leonard 2010; see 3.1). This is reflected in the network graph where Quarters do not appear as independent entities, but they are connected to

[63] Girvan and Newman (2002, 7821) created this 'figurative sketch of a network' based on their expertise in understanding the structures of highly clustered networks.

each other. Regardless, they are still called clusters in this thesis because they visually share many properties of clusters including dense intra-community connections and few connections with outside Quarters. These gaps between individuals in different Quarter communities appear as structural holes throughout the network in Figure 24. This graph also shows that there are not only gaps between Quarters, but also within Quarters. This pattern indicates that Quarters are comprised of multiple subcommunities.

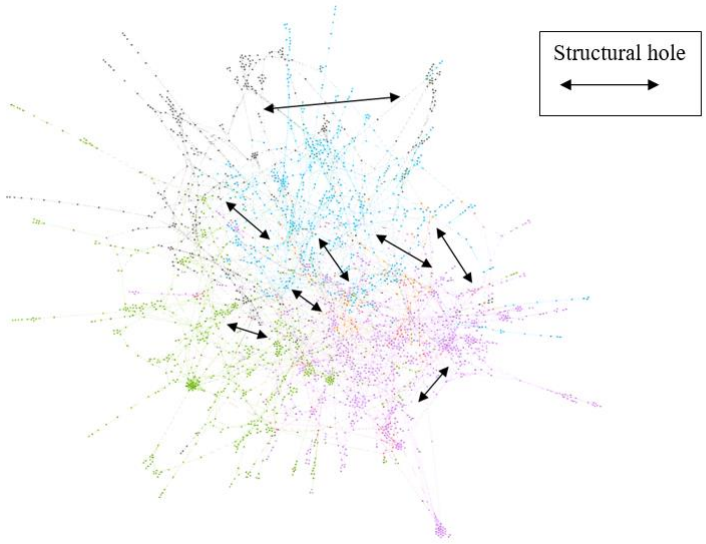


Figure 24 Graph showing locations of some of the structural holes in the narrative network

3.5.2 Community Detection

Up to this point, individuals have been manually assigned to their narrative units of reference and visualisations have been generated using this process. This approach helps detect clusters in the network based on how the narrative is structured, but is the best way to categorise and find subgroups *S*? Are there other subcommunities in the network that better represent thirteenth-century Icelanders' perceptions of regional identities in the *landnám*, but are obscured by manually assigning values? To see if any subgroups naturally emerge in the text based on how individuals interact with each other, community detection algorithms are applied to the narrative network. Community detection algorithms automatically detect clusters in the network by evaluating what subgroups are densely interconnected and sparsely connected to external groups.

To apply community detection algorithms to *S*, all nodes that have a degree of zero are removed from the network and then the modularity function in *Gephi* is employed. Modularity measures the strength of division of a network into clusters also known as modules, groups, communities. It is useful in identifying different communities within the structure of a specified network. This setting uses the Louvain method to detect clusters. The mathematical structures behind the algorithm are explained fully in Blondel et al. (2008). Simplified, the measure finds clusters at the local level and amalgamates these nodes into one group and this process is repeated and these groups join other groups eventually forming supergroups. In other words, it is a clustering of clusters similar to a dendrogram.

The modularity function in *Gephi* has identified forty-two subgroups in the main subcomponent of the narrative network of *S*.[64] Figure 25 is a visualisation where each colour represents a different subgroup. At this level, it is difficult to interpret the graph because it is cluttered, but it demonstrates potential for finding subgroups in the narrative which would have not been detected using manual approaches. To see if this method has accurately identified a subgroup that corresponds to known geographical, social, political, or familial identities, one of these clusters has been extracted to explore if there are any shared commonalities between the individuals assigned to this group.

[64] The resolution is set at 1, the standard setting for modularity in *Gephi.*



Figure 25 Narrative network's giant component partitioned by modularity class

Figure 26 is a cluster automatically identified using community detection algorithms, this cluster is located within the black circle in Figure 25. This attempt is a partial success because it effectively identified two strongly connected groups, one circled in yellow in Figure 26 and the other in blue, who are bridged via a woman, Álǫf *elliðaskjǫldr* (S40, S174, S341).

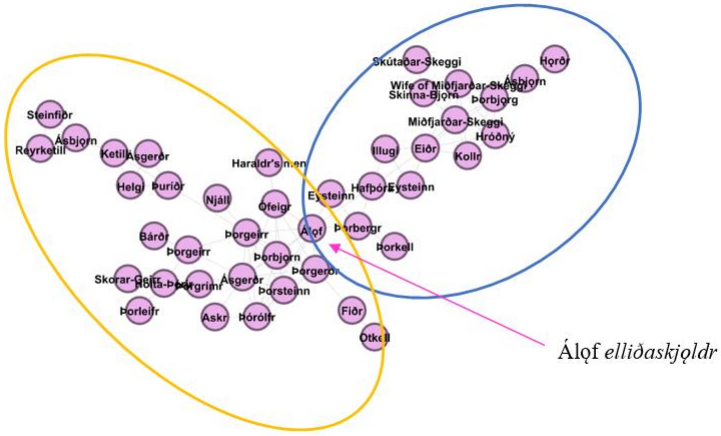


Figure 26 Cluster identified using community detection

The group to the left of Álǫf *elliðaskjǫldr*'s node that is circled in yellow in Figure 26 is mainly comprised of individuals who have relationships

with Álǫf's family before they arrive in Iceland and with people they establish relationships with shortly after arriving in the Southern Quarter. It is worth describing the *landnám* narrative of Álǫf's family because all these individuals appear within this cluster.

Álǫf was the daughter of Ásgerðr, daughter of Askr, and Ófeigr, who was put to death by Haraldr's men (S341). After his death, Ásgerðr left Raumsdalr in Norway with her children: Þorgeirr *gollnir*, Þorsteinn *flǫskuskegg*, Þorbjǫrn *kyrri*, and Alǫf, and her illegitimate brother, Þórólfr. Ófeigr had another daughter named Þorgerðr who married Fiðr, son of Otkell. She claimed land between Seljalandsmúli and Markarfljót as well as Langanes up to Jǫldusteinn and lived in Katanes. Ásgerðr gave approval to Þórólfr to settle in her claim and he farmed at Þórólfsfell and fostered her son Þorgeirr (S342). Þorgeirr was the father of Njáll, *er inni var brenndr* 'who was burnt in his house' (ibid.). Þorgeirr's daughter was Þuríðr who married Ketill *enn augði*. Ketill was the son of Ásbjǫrn, brother of Steinfiðr and they were sons of Reyrketill (S343). Also, in Iceland Ásgerðr remarried to Þorgeirr *enn hǫrzki*, son of Bárðr *blǫnduhorn*, who was another settler who farmed at Holt. They had two children, Þorgrímr and Holta-Þórir, with him (S340). Þorleifr *krákr* was Þorgeirr's son from a previous marriage. Holta-Þórir's son was Skorar-Geirr. The locations of individuals associated with the yellow cluster are identified by the yellow markers in Figure 26.

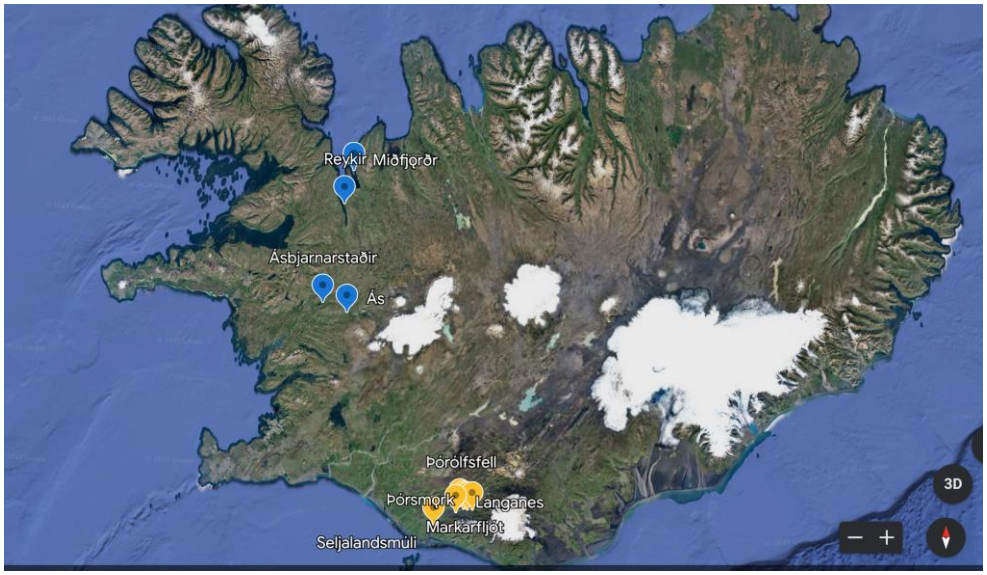


Figure 27 Map of locations associated with individuals in the cluster in Figure 25

Álǫf goes on to marry Þorbergr *kornamúli*, son of Þorkell *kornamúli* the settler of Ás, their children are Eysteinn and Hafþóra, who marries Eiðr, son of Miðfjarðar-Skeggi (S341). Miðfjarðar-Skeggi's other children with an unnamed wife are Skinna-Bjǫrn, Kollr, Hróðný, Þorbjǫrg, who married Ásbjǫrn *enn auðgi* the son of Hǫrðr (S174). Hafþóra and Eiðr's child is Illugi. These individuals comprise the blue cluster of nodes to the right of her node and the locations associated with them are marked in blue in Figure 27.

At present it could be said that the community detection algorithm was partially effective. It accurately identified tightly knit group of individuals in the south of Iceland—nodes to the left of Álǫf's node. However, the marriage between Álǫf and Þorbergr *kornamúli* connects a seemingly disparate group located further north and associated with Miðfjarðar-Skeggi. Outside of the marriage, the two halves of Figure 26 seem tenuously connected at best because of the geographical distance between them; however, this distance could be attributed to this being a second marriage. Nevertheless, the community detection algorithm clustered these individuals together at this resolution rather than having them be attached to, or form other groups.[65] Therefore, it is worth going back to the ON-I corpus to see if this group has connections elsewhere besides the marriage that would explain this phenomenon or to confirm if it is just a result of these groups not being well-connected to other clusters. Additionally, the resolution level could be set at different levels to see if Figure 26 remains a cluster or the two groups separate at some point.

3.5.2.a Community detection: at a larger scale

The resolution level of the modularity algorithm can be adjusted to look at group formation at different levels. If the resolution is lowered to a number below one many more, smaller communities will emerge. If the resolution is increased there will be fewer, larger communities. For example, increasing the resolution to ten produces Figure 28. The number of communities detected drops from forty-two to only six.

[65] The resolution parameter in community detection algorithms 'controls the scale on which we would like to observe the communities in a network' (Han et al. 2016, 2).

The automatically generated graph is almost identical to Figure 29, a graph where individuals are manually assigned to their narrative units. This indicates that textual divisions can be for the most part accurately identified in *S* using community detection measures. It is important to note that when using community detection, people are not assigned to a cluster based on where they appear in the text, or another manually designated category (i.e. what Quarter they are associated with). Instead, community detection measures automatically identify clusters by grouping together individuals who have strong relationships with each other. So, in Figure 28 a person may be grouped into the 'wrong' Quarter, but they might be more closely associated with people that make up that regional cluster. However, there is usually a large overlap between automatic and manual approaches.

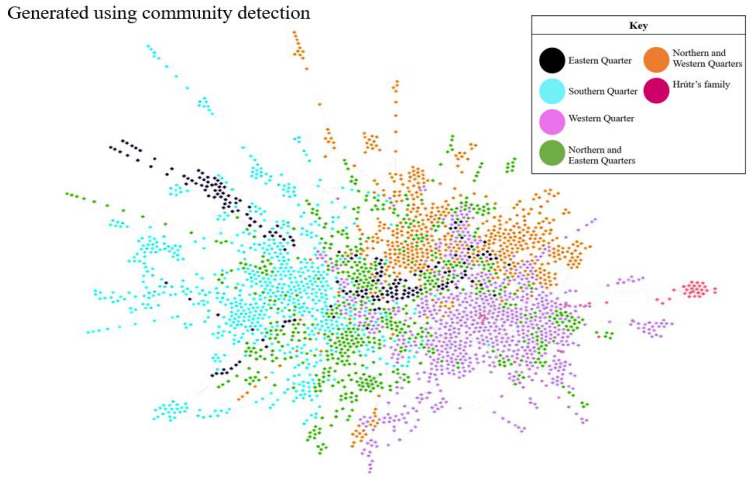


Figure 28 Graph generated using community detection methods

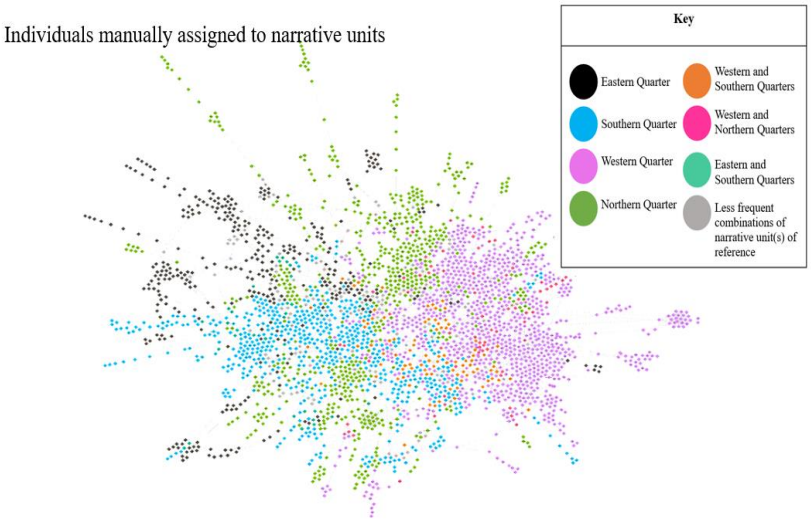


Figure 29 Clusters generated by pre-assigning narrative unit(s) of reference

The main difference between the Figures 28 and 29 is the area of the graph that corresponds to the Northern Quarter region. Instead of assigning all people in the Northern Quarter into one cluster, the modularity measures split the Northern Quarter into two clusters as demonstrated by the green and orange areas in Figure 28. Looking at individuals who make-up these communities, it appears these two clusters are formed based on geography. The green section includes individuals living in the Northern and Eastern Quarters and includes prominent settlers like Ingimundr *enn gamli* and Hrollaugr. Ingimundr is given a long, detailed land-claim narrative in *S* and is recognised in S262, the conclusion chapter of the Northern Quarter as one of its noblest settlers (S177, S179, S180, S183, S184, S188, S262, S398; see also 5.5.5.a.ii). Hrollaugr, the son of Jarl Rǫgnvaldr and friend of King Haraldr, takes a sizeable land-claim in the Eastern Quarter and controls who settles in his claim (S305, S309-S315, S335; see also 4.2.2, 4.3.2, 4.4.1, 5.3.1.c.ii). He is also listed as one of the most important settlers in the Eastern Quarter (S335).

The orange region contains individuals associated with north and west in *S* and includes important settlers like Helgi *enn magri*. Helgi like Ingimundr is recognised as one of the leading settlers in the Northern Quarter and in *S* he effectively controls who settles in Eyjafjǫrðr (S95, S121, S122, S127, S140, S151, S217, S218, S219, S226, S229, S230, S231-S236, S238, S245, S249, S262, S399, see also 5.5.2.b and other centrality results). Returning to Figure 29 to reassess the Northern Quarter's position in the network, this divide becomes clearer because the green nodes appear to cluster in opposite directions in the graph towards the north and the south. This is strong evidence to suggest that even though the Northern Quarter is presented as a cohesive unit in the text, it might have been thought of—consciously or subconsciously—as divided area with the northeast and northwest having their own communities. Therefore, more analysis could be carried out in the future to determine where exactly does the divide in the Northern Quarter appear in the network and is it caused by geographical or political factors?

There is also a small cluster of magenta nodes in Figure 28 that is not found in Figure 29. This cluster is comprised of a man named Hrútr, who lived

at Hrútsstaðir, and his family. His family visualises as an independent cluster in Figure 28 because he and his wife, Hallveig, have twenty children named in *S* (*þau áttu mǫrg bǫrn*) (S160). However, none of their children have many relationships outside of those with their siblings, therefore, this group appears to be disconnected from the main subcomponent. The importance of Hrútr in the network is explained in more detail in 5.5.5.a.i; at present, it is enough to point out that his cluster is not identified as a separate unit when manually assigning individuals to Quarters like in Figure 29.

Ultimately, the overarching pattern of Figure 28 suggests that Quarters are not just contemporary geo-administrative boundaries superimposed on the text by compilers, but rather Quarters are viewed as the natural way groups developed in Iceland based on how individuals interacted in the *landnám*. Of course, people will appear in the network based on what Quarter they are listed in the text, which correlates to where they are associated in Icelandic landscape. However, when these elements are removed, and individuals are grouped automatically it is still based on geography. This indicates that Quarters were a natural evolution of relationships and social organisation in the *landnám* and they became an effective way to divide the country based on settlement patterns.

These examples demonstrate that community detection algorithms are a useful tool to help identify groups that may not be connected using conventional methods. Additionally, if they accurately detect a cluster which corresponds to a well-known family group correctly, it could be used as additional evidence supporting that groups historicity. This is because these individuals would naturally connect in the network without the researcher's influence. However, it is important to stress that automatically detected clusters should not be taken at face-value and must be interpreted manually to see if they represent any reasonable historical, literary, or cultural clusters or are simply anomalies. These processes also currently lack the nuance to deal with individuals who have memberships in multiple groups as they can only assign them to one cluster. Nevertheless, these measures provide a good starting point for researchers to start thinking about relationships between individuals that they would not normally connect.

3.6 Narrative Structure at the Individual Level

To analyse if the narrative structure of *S* impacts relationship formation at the individual level, each person was sorted by how many Quarter units they are attested in. It stands to reason that if an individual is referenced throughout *S* that they are well-remembered and have social and geo-political influence across Iceland e.g. broker cross-Quarter relationships like marriages. On the other hand, if a person is only mentioned in one narrative unit, they probably do not hold power outside of their Quarter. This process helps identify whether the geographical arrangement of *S* limits individuals from having too much influence because they are constrained to a certain area of the text. Alternatively, do the people who appear in three or more Quarter units, hold positions of power recognised across all of Iceland? Figure 30 is a table showing the percentage of individuals attributed to one, two, three, or four Quarter sections of *S*.[66]

Number of Quarters Individual is Mentioned in	Percentage of Individuals in *S*
One Quarter	90.17%
Two Quarters	8.64%
Three Quarters	1.03%
Four Quarters	.16%

Figure 30 Table showing the percentage of individuals attributed to one, two, three, or four Quarter sections of Sturlubók

3.6.1 Emplacement: Individuals Associated with One Quarter

The overwhelming majority of individuals, 2,806 (90.17%) are associated with only one Quarter in *S*. This high percentage suggests that the composition of the social networks in *S* reflect a hyper-regionalised Iceland where individuals near exclusively engage with people in their same Quarter (see Figure 15). This is further supported by the lack of individuals referenced in multiple Quarter sections. This result is not surprising because the textual structure of *S* inhibits people from explicitly making connections across the text if they do not appear

[66] Individuals who are either only mentioned in the Introduction (S1-S5) or Conclusion (S398-S399), or in these narrative units and one Quarter are treated as being only referenced in one Quarter.

in multiple narrative units, thus, to make connections across the network, intermediaries who are referenced in multiple Quarters are needed.

Even if an individual is referenced in multiple chapters, they are usually confined to one narrative unit. For example, Ketill *hængr* is referenced in chapters S344-S345, S347-S350, S357, S367, S397-S398. All these attestations—except for chapter S398, where he is referenced as a patronymic in a conclusion chapter of *S* (which does not impact where his relationships are taking place)—all other attestations of Ketill are in the Southern Quarter (see 3.2.2.c and below).

This high concentration of individuals attached to one Quarter is quantitative evidence for what Ward (2019, 136) has identified in *Ldn* as 'emplacement' where a human body is located at a central point that 'has a defined horizon of engagement with the real landscape, such that the landscape and the individual are co-bounded' (see also Casey 2009). Since *S* is organised in a manner that enumerates settlers systematically according to their placement in the landscape, and at a higher-level quadrant-by-quadrant, most individuals in *S* are bound to their micro-environments—individual land-claims, which in turn are restricted to the landscape and their Quarter. This method of categorisation is useful for conceptually attaching people and their genealogies to the landscape, but it is limiting in the sense that it is harder to connect individuals who are not kin across Quarters because there is no narrative space for these types of relationships.

For instance, Ketill *hængr*'s position in Figure 31, is an example of emplacement. He is centrally situated in the Southern Quarter. Figure 32 is a magnified version of Ketill's location in the network graph which shows the localities that he and his connections operate in which are identified by the ovals.[67]

[67] Ketill and his son Hrafn are mentioned in the Southern Quarter and Conclusion narrative units in *S* (for Hrafn see S344, S357, S398).

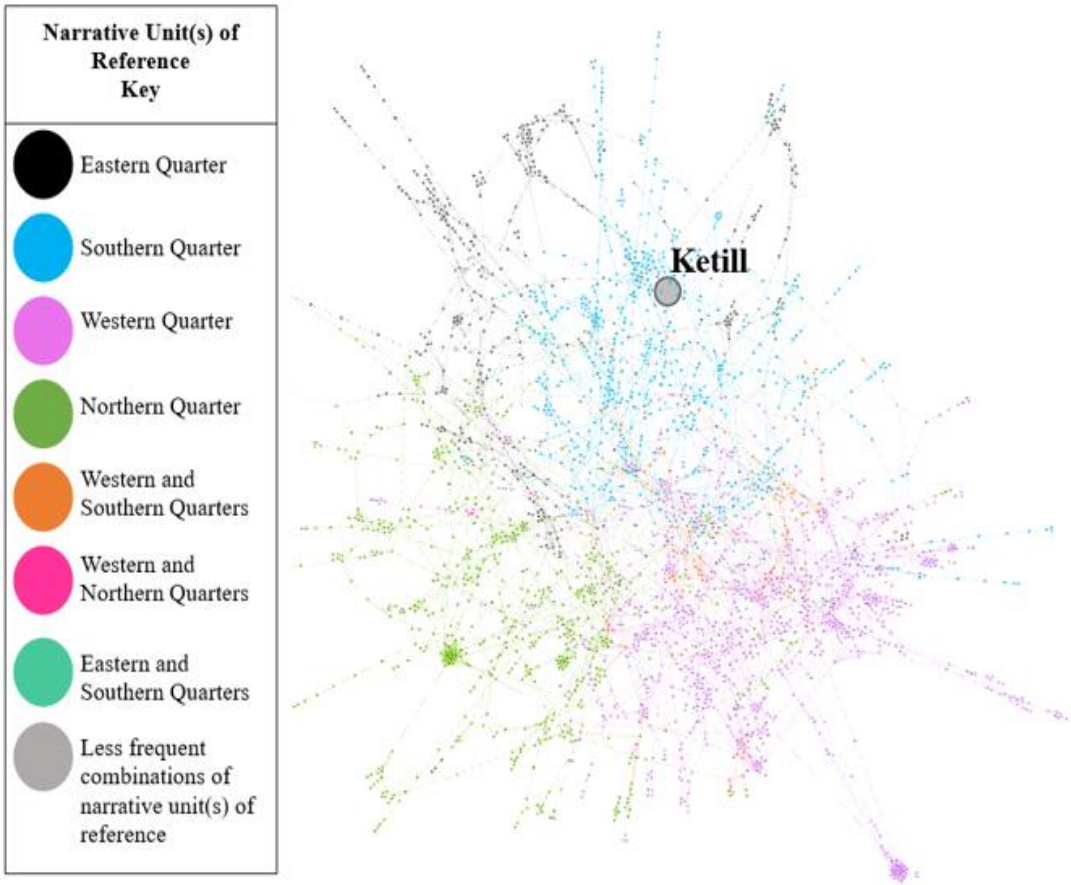


Figure 31 Ketill hoengr's location in the narrative network

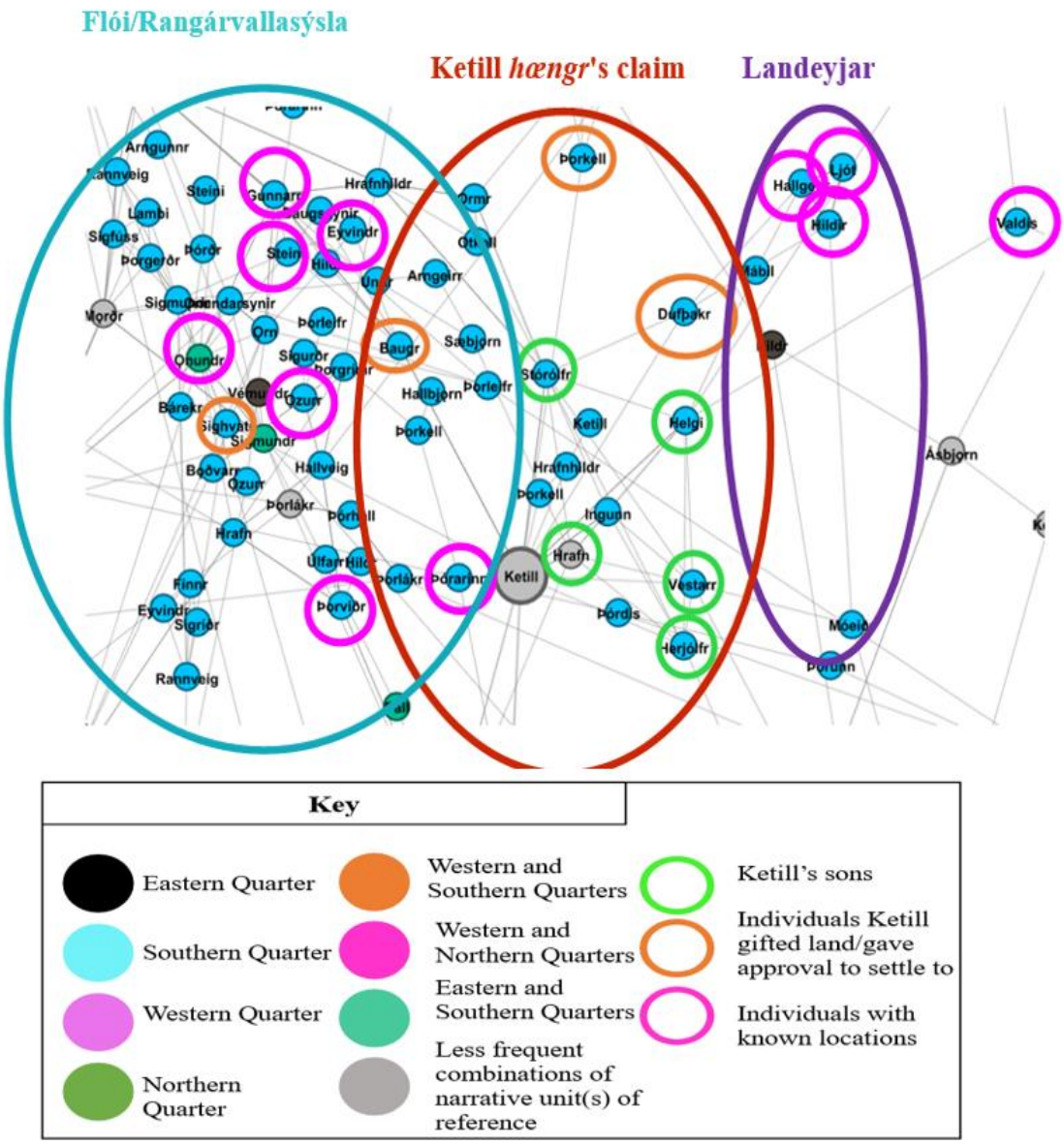


Figure 32 Magnified view of Ketill hængr's location in narrative network

The red central oval in Figure 32 represents the area of the network associated with Ketill's land-claim. He lived at Hof and his claim is bounded by Þjórsá, Markarfljót, Rangá, Hróarslœkr, Reyðarvatn, and Þverá, and neighbours the farm Breiðabólstaðr. All these locations are shown in Figure 33.

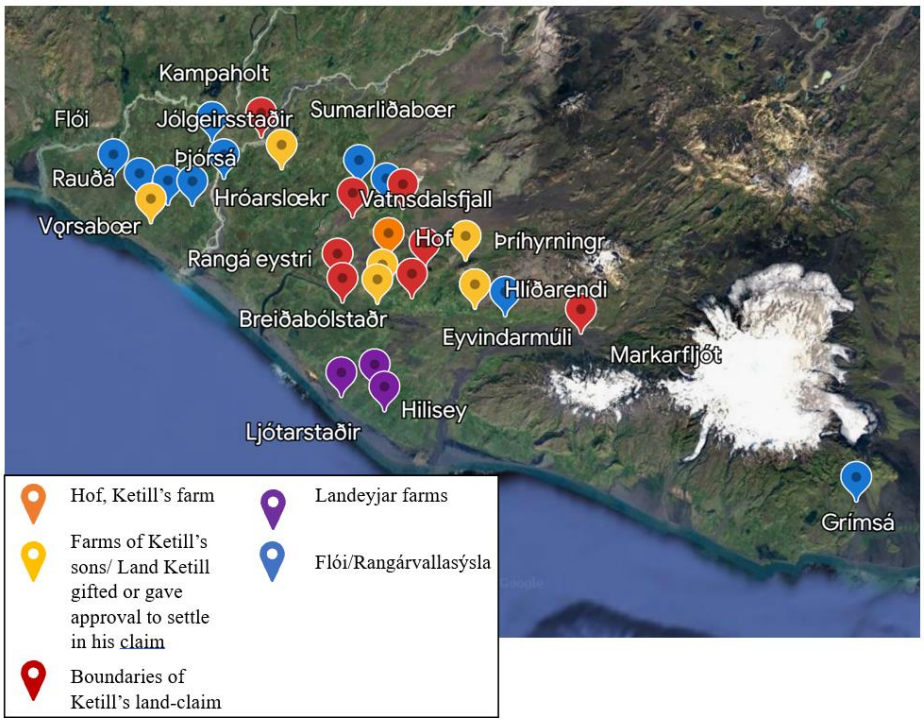


Figure 33 Locations associated with individuals in Figure 31

In Figure 32, Ketill is surrounded by his five sons—Hrafn, Vestarr, Helgi, Storólfr and Herjólfr—whose nodes are circled in light green. Storólfr and Herjólfr are explicitly associated with farms, Stórólfsvǫllr and Sumarliðabœr (Brekkr) both are located within Ketill's claim (S344, S350). Hrafn also likely stayed around Hof given his lineage's association with the area. Helgi married Valdís, whose father Jórgeirr lived at Jórgeirrstaðir which is near the Þjórsa, one of Ketill's boundary points. There is no indication where Vestarr lived, but he married Mœiðr. daughter of Hildir of Hilisey in Landeyjar which is the region neighbouring the land-claim to the south (Figure 33). Therefore, Ketill's family is firmly embedded in his original land-claim.

Ketill exerts more control over his land by creating dependents through the acts of gifting or giving approval to others to settle within his claim (see also Skalla-Grímr in 5.3.1.c.iii.1). These men include Dufþakr, Sigvatr, Þorkell, and Baugr, who settled at Dufþaksholt, Markarfljót, Þringhýngr, and Hlíðarendi respectively (S344-S345, S347-S348). The nodes of these individuals appear near Ketill in the network (orange circles) because they are they are bounded through obligation and proximity.

Vestarr's marriage to Mœiðr forms a connection between individuals in Ketill's land-claim with the Landeyjar subgroup who are circled in purple in Figure 33. There is another connection between Ketill's group and the Landeyjar region via Dufþakr at Dufþaksholt. Dufþakr was a freedman of Hildir and was given land by Ketill (S344, S350).

Ketill also has links to his neighbours to the northeast of his land-claim around the Flói/Rangárvallasýsla area and this proximity is show in both Figures 32 and 33.[68] This connection stems from Ketill's strong relationship with his blood-brother/foster brother Baugr, who settled at Hlíðrendi with his approval. Baugr's sons are largely located within this region with Gunnarr at Gunnarsholt, Steinn at Snjallsteinshǫfði and his daughter, Hildr marrying Ǫrn who lived at Vælugerði.

Another son of Baugr, Eyvindr settles Eyvindarmúli, which is still in the Southern Quarter, but physically distant from his kin's farms. Yet in the network graph, Eyvindr is located near his kin group (within the teal oval) because he established no relationships around Eyvindarmúli. This could be an example of the contemporary kin group attempting to artificially expand their influence beyond Flói/Rangárvallasýsla. Since Eyvindr's personal name is shared by the place-name it could equally indicate that he was an 'invented' brother to alter the perception of how far their land extends (see 5.6).

Although most positions in the network are determined by local geography, it is not always the case. Three individuals who are close to Ketill on Figure 32—Þorkell, Hrafnhildr, and another Ketill—are all based in Norway. Since there is not a strong network of Norwegian-only connections, these individuals are pulled into the Icelandic network because they have only a few social relationships, therefore, it is understandable that they are near him in the network graph even though they remain in the homelands.

It could have been a conscious decision by Sturla or other compilers to associate an individual like Ketill with only one region by placing them within specific textual boundaries. However small regional subcommunities naturally

[68] Rangárvallasýsla is the best regional descriptor for this area although it is later than the landnám.

emerge in the network following local geographical patterns. The relationships in these local groups are complex and emulate how individuals would form connections based on topography. It would be difficult to independently invent an individual, their backstory, their kin relationships and then attach all of these elements to a plot of land, which in turn must cohesively fit with other *landnám* narratives. Of course, some relationships and locations can be slightly altered to fit a contemporary need, but the structure of the text appears to be based on how thirteenth-century Icelanders perceived historical social interactions and regional identities. These initial interactions would have embedded themselves into the cultural memory through emplacement and been inherited over extensive periods of time like the land itself.

3.6.2 Individuals Referenced in Three or More Quarters

There are only thirty-seven individuals who are referenced in three or more Quarters.[69] Figure 34 lists these individuals and their narrative units of reference. Looking at who comprises this group, these individuals held influence across Iceland and were not restricted to relationships in a specific region.

Individual	Narrative Units of Reference	Notable Characteristics
Þorlákr *biskup enn helgi*	north, east, south	Clergy
Haraldr *konungs enn hárfagri*	intro, west, north, east, south	King of Norway
Miðfjarðar-Skeggi	west, north, south, conclusion	Leading *goði* ‘chieftain’ in the North
Þórr	west, north, south	God
Brandr *biskup*	west, east, south	Clergy
Þorgeirr *goði at Ljósavatni*	west, north, south	Goði
Sæmundr *prestr enn fróði*	intro, north, east, south	Priest and historian
Hákon *jarl*	west, north, east, south	Jarl, son of Grjótgarðr

[69] Individuals mentioned in two Quarters are not discussed for brevity, but it worth noting that many bridge communities across regions.

Individual	Narrative Units of Reference	Notable Characteristics
Grjótgarðr *Hlaðajarl*	west, north, east, south	Jarl of Lade, Norway
Eyvindr *austmaðr*	west, north, south	Father of Helgi *enn magri* and married Rafarta daughter of king Kjarvalr
Ketill *flatnefr*	west, north, east, south	Son of Bjǫrn buna. Conquered the Hebrides
Gizurr *biskup*	north, east, south	Clergy
Ketilbjǫrn *enn gamli*	west, north, east, south	Leading settler in the Southern Quarter
Helga	north, east, south	Married to Ketilbjǫrn *enn gamli,* descended from Bjǫrn *buna*
Þórðr	north, east, south	Descended from Bjǫrn b*una*
Grímr	west, east, south	Killed Ásbjǫrn *jarl skerjablesi* in the Hebrides
Tungu-Oddr	west, east, south, conclusion	Leading goði in the Southern Quarter
Þormóðr	west, east, south	Son of Þjóstarr, involved in narrative scenes
Þjóstarr *á Álptanesi*	west, east, south	Involved in narrative scenes
Ásólfr *flosi í Hǫfða*	west, north, east	Of Hofði, not a settler married a descendant of Auðr *djúpauðga*
Øxna-Þórir	west, north, east	Direct Norwegian ancestor of Eiríkr *rauðr*, Þorsteinn *enn hvíti*, a leading *goð*i of the East, settlers Kráku-Hreiðarr, Eysteinn, and Þorvaldr, and was the former owner of a settler named Þórir *dúfunef*
Sturla *enn gamli*	west, north, east	Sturlusynir lineage
Þorbjǫrn *í Arnarholti*	west, east, south	Settler at Arnarholt, daughter married to a man based in the west, his brother settled in the East.
Helga	north, east, south	Sturlusynir lineage
Guðný	north, east, south	Sturlusynir lineage
Sturlusynir	north, east, south	Sturlusynir lineage
Rǫgnvaldr *jarl á Mœri*	west, north, east	Jarl
Eysteinn *glumra*	west, north, east	Son of Sigurðr *jarl enn ríki í Orkneyjum*

Individual	Narrative Units of Reference	Notable Characteristics
Þóroddr	west, east, south	Son of Tungu-Oddr, married Jófríðr
Jófríðr	west, east, south	Married Þóroddr
Gunnarr	west, east, south	Father of Jófríðr
Illugi *enn svarti*	west, north, south	Present at Hellisfitjar for killing 18 cave-dwellers and burnt Auðun. Descended from Ørlygr *enn gamli*
Þórir	west, north, south	Norwegian father of Grímr *enn háleynski* and Hrómundr
Grímr *enn háleyski*	west, north, south	Son of Þórir, brother of Hrómundr, settler
Hrómundr	west, north, south	Son of Þórir, brother of Grímr, settler
Smiðkell	west, north, south	Father of Auðun, leader of the cave-dwellers. Hosted Þorvaldr who wrote a poem.
Bálki	west, north, south	Settled Hrútafjǫrðr, father of Bersi *goðlauss* and fought against King Haraldr

Figure 34 Table of individuals appearing in three or more narrative units in Sturlubók

Four of these individuals are clergy including the Bishops Þorlákr, Brandr, and Gizurr, as well as Priest Sæmundr. Their insertion into genealogies of kin groups based all over Iceland appears to be an attempt to establish prestige in a Christianised Iceland (Clunies Ross 1993, 383). Curiously other bishops—Runólfr, Guðmundr, Runólfr and Bjǫrn—are only associated with one Quarter, often only being referenced in one chapter. Jón *biskup enn helgi* is of particular of interest because it would be assumed that he would be mentioned in the Northern Quarter narrative because he was the first bishop of Hólar; however, he is only referenced in the Eastern and Southern Quarters (S14, S310, S339, S366). Considering he had no children and came from Breiðabólstaðir, in the south of Iceland, it could have been difficult for families in the North to claim descent from him or insert him via consanguineous or affinal kinship into their lines.

Many individuals who comprise this group are relatives of, or have a connection to, Bjǫrn *buna*, a Norwegian *hersir* ‘chieftain’ who functions as a unifying ancestral figure in *S*. For example, Ketill *flatnefr*, Eyvindr *austmaðr*, Helga, Ketilbjǫrn *enn gamli*, and Þórðr are all associated with Bjǫrn. The

emergence of this kin group in Figure 34 is not surprising because many individuals from this family rank amongst the highest in centrality measures, measures that help identify the most important people in a network. The influence of Bjǫrn and his kin in *S* will be discussed in more detail in 5.4 and 5.5.3.b.i.

Despite being based in Norway the Jarls Rǫgnvaldr, Grjótgarðr, Hákon, and King Haraldr *enn hárfagri* are all mentioned in three or more Quarters. Although they do not directly influence the socio-political structure of Iceland, their injustice is commonly cited as a reason why individuals emigrate. Jarl Rǫgnvaldr did not give his son Hrollaugr the jarldom in Orkney, which led to Hrollaugr migrating to Iceland and becoming the most prominent settler in the Eastern Quarter (S309-S310). Here the genealogical connection to Jarl Rǫgnvaldr and his friendship with Haraldr not only advances the plot, but also Hrollaugr's prestige. Jarl Hákon fell out with five individuals causing four to immediately travel to Iceland and the other to move to another location in Norway, although this man's son eventually went to Iceland (S149, S154, S225, S241, S270). Hákon's father, Grjótgarðr, appears whenever Hákon is referenced, which alone explains why he is mentioned in multiple narrative units because he does not have much of a role in the text. Perhaps the most notorious of this group is King Haraldr whose tyranny makes him a key figure in the creation of an Icelandic origin narrative (see 5.5.2.a.ii).

Another individual who appears in Figure 34 is Øxna-Þórir, who is the direct ancestor of Eiríkr (*hinn*) *rauðr,* Þorsteinn *enn hvíti*—a leading *goði* of the East, and the settlers Kráku-Hreiðarr, Eysteinn, and Þorvaldr (S89, S158, S197, S202, S227, S228, S270). He was also the former owner of the settler named Þórir *dúfunef.* Therefore, Øxna-Þórir appears to serve as a prestigious pseudo-mythological ancestral figure of Vápnafjǫrðr—although many of his progeny are spread around the island as evidenced by his appearance in multiple narrative units (ÓlLárLdnSkag 60-1; S197n4). His extended genealogy can be seen in Figure 35 which includes prominent individuals mentioned elsewhere in the ON-I corpus.

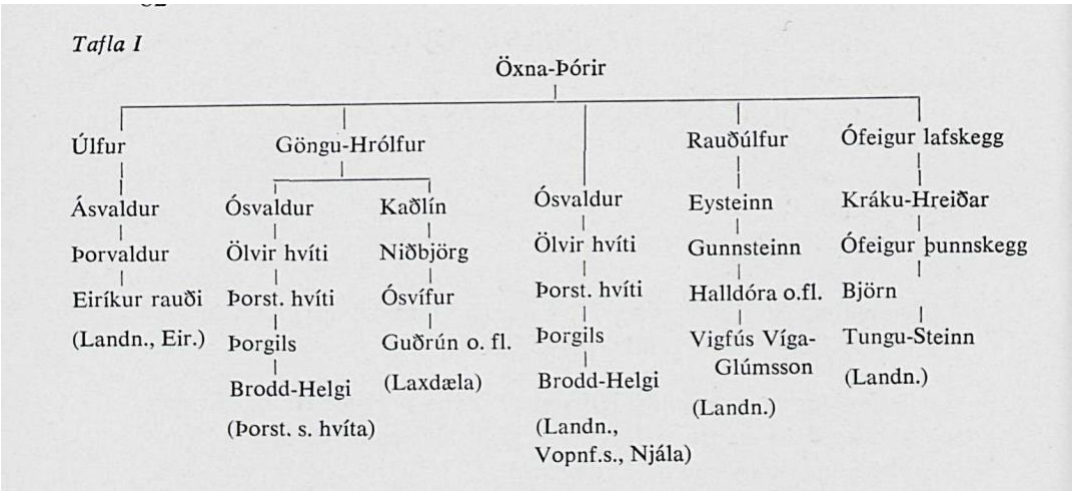


Figure 35 Genealogy of Øxna-Þórir's descendants across the ON-I corpus (Ólafur Halldórsson 1980, 82)

Grímr *enn háleyski* is mentioned in the West, North, and Southern Quarter narrative units often with his father, Þórir, and his brother, Hrómundr—father of Gunnlaugr *ormstunga enn gamli* (S15, S29, S41, S46, S48, S179). This is interesting because Skalla-Grímr, who gave Grímr *enn háleyski* his claim, is only referenced in the West, South, and Conclusion narrative units. His appearance in more Quarters than Skalla-Grímr may indicate that he originally had more influence than Skalla-Grímr that could not be completely obscured by Skalla-Grímr's narrative in *S*. Alternatively, Sturla had an interest in Grímr *enn háleyski*'s lineage because through Úlfr, Grímr *enn háleyski*'s son, it merged with his personal genealogy (S41; Stevens 2011, 30). Integrating Grímr *enn háleyski* and combining his line with Skalla-Grímr's provides access in the network to Ingimundr *enn gamli*, one of the main settlers of the north. Ingimundr was fostered by Þórir and raised alongside Hrómundr and Grímr *enn háleyski* and all three received a prophecy that they would settle in Iceland together (S179). This is the most direct pathway for the Sturlusynir, a powerful thirteenth century family that Sturla Þórðarson belonged, to reach Ingimundr in the network.[70] In addition, individuals associated with the Sturlusynir like Sturla *enn gamli*, Helga, and Guðný appear multiple times

[70] The Sturlungar, more commonly referred to as the Sturlusynir 'sons of [Hvamm]-Sturla' in *S*, were main participants in the *Sturlungaöld* 'Age of the Sturlungs', a period of infighting between family clans in mid-thirteenth century Iceland. Notable members of the group include Hvamm-Sturla (the progenitor of the group), Snorri Sturluson, Sighvatr Sturluson, and Sturla Þórðarson. The terms Sturlungar, Sturlusynir, and Sturlungs are used interchangeably in the thesis.

throughout the text, promoting the agenda that this group had an island-wide reach.

Tungu-Oddr of Reykjadalr and individuals from his consanguineal and affinal kin groups like his son Þóroddr, daughter-in-law Jófríðr, and her father, Gunnarr, all appear in the Western, Eastern, and Southern Quarters. In *S*, Tungu-Oddr is acknowledged as a leading *goði* in the south, but he is not given as much narrative emphasis as Skalla-Grímr who is also associated with Borgarfjǫrðr (S398). Thus, SNA has identified that Tungu-Oddr has resonance across Iceland as a figure in people's minds via his *landnám* relationships even if his description is less illustrious here compared to his appearances in other areas of the ON-I corpus (ÍF II 84; Stevens 2011, 26-7, 32-3). This demonstrates that SNA can be used to find areas where individuals influence may be enhanced or decreased depending on contemporary issues, it is then up to the researcher to investigate what these needs might be and how they altered the perception of this individual.

3.7 Conclusion: Visualising the Narrative Structure of Sturlubók

Chapter III demonstrates how to work with 'fuzzy' variables like geographical boundaries in *S* and subject them to an SNA approach. By creating distinctive narrative units that reflect geo-textual boundaries as accurately as possible, networks were generated that emulate the quadripartite structure of *S* (see Figure 15). In network graphs partitioned by narrative unit(s) of appearance, geography is the strongest organising agent. The position of a node in a network graph is often dictated by that individual's location on the 'real' Icelandic landscape. This pattern suggests that Quarters were not only effective textual divisions, but that they also served as a cognitive tool, which mentally and physically embedded a person into the landscape (Ward 2019, 131, 136).

The layout of network graphs like Figure 15 sheds light into how thirteenth-century Icelanders like Sturla perceived communities (Quarters) in the *landnámsöld*. There is no cognitive dissonance using Quarters

(contemporary land divisions) to organise a historical text; this indicates that Quarters were perceived as an evolution of socio-political organisation in settlement period, or that the North, West, South, and East were thought of as communities before Quarters were formally institutionalised. Additionally, these regions emerge as distinct areas in the network graphs, but they are not fully independent clusters. This is in part attributed to certain relationships transcending Quarter boundaries. For example, although they rarely happen in *S,* there are instances of, marriages that take place across Quarter boundaries and of people moving from one region to another (see Þórðr *skeggi* in 4.4.1 and Þuríðr in 6.5.2.b). Thus, people of one Quarter could establish relationships with individuals associated with another Quarter. This supports the idea that there was an overarching sense of Icelandicness by the thirteenth century that was established through the construction of an internal hierarchy with the individuals at the top serving as intermediaries between the Quarters.

But how do these separate regions come together to form a whole and what makes them still appear as recognisable regions in network graphs? To explore these and similar questions, the next chapter, IV, will focus on the narrative subunit of Kolskeggr's contribution to see how land-claims attributed to him, which correspond to the southeastern coast of Iceland, integrate (or not) into the overarching narrative network.

IV Case Study: A Social Network Analysis of Kolskeggr's Contribution in *Sturlubók*

Kolskeggr's contribution in *S* is marked by its 'stylistic distinctiveness' (ÍF I cvi-cx; Callow 2011, 17). In S287, he is explicitly acknowledged as an authority by Sturla, *Nú hefir Kolskeggr [Ásbjarnarson] fyrir sagt heðan frá um landnám*, 'Now begins Kolskeggr's account/dictation/writings of the *landnám*'.[71] Following this attribution, land-claims along the eastern and south-eastern coast of Iceland are enumerated. These land-claims often lack anecdotal material found in other parts of *S*. They are all similar in narrative structure, typically adhering to the formula of 'N settled X fjord and the N/X family is descended from him' (Adolf Friðriksson and Orri Vésteinsson 2003, 144). For example, *Herjólfr hét maðr, er nam land allt út til Hvalsnesskriðna; hans son var Vápni, er Vœpnlingar eru frá komnir*, 'There was a man called Herjólfr who took all the lands out to Hvalsnesskrið; his son was Vápni, from whom the Vœpnlingar are descended' (S299). There is no accompanying statement on where Kolskeggr's contribution concludes, but it suggested to end at S335, which geographically corresponds to the Jǫkulsá, the physical boundary between the Eastern and Southern Quarters (JJóhGLdn 68; ÍF I cvi-cx; S289; Callow 2011, 17).

The attribution to Kolskeggr, geographical concentration of settlements, and stylistic distinctiveness of land-claims creates a clear narrative subunit, S288-S335, which can be subjected to SNA and VA. Visualising and quantifying Kolskeggr's subunit generates graphs that can be used to 'see' whether his influence appears in the overarching narrative networks of *S*. If so, it would further support that *S* and *Ldn* are a result of a collaborative network of contributors (Barði Guðmundsson 1938; 1959, 76-93; ÍF I cxv-cxvi). To explore how relationships were conceptualised across time by multiple compilers, the following questions are investigated in this case study:

[71] Ulff-Møller (2016, 909-10) observes that this acknowledgment comes after Kolskeggr's own family genealogy, S282, so this starting point can be called into question; however, since this thesis follows the text as closely as possible, S287 is considered the beginning. From Kolskeggr's *ætt*, S282, it is speculated that that he could have lived in the twelfth century, but likely no later than 1130 (Barði Guðmundsson 1959, 76-9; ÍF I cvii).

- Is Kolskeggr operating in a similar conceptual framework as other compilers and recording the same kinds of relationships?
- Are individuals recorded by Kolskeggr connected to the overarching narrative networks of *S*?
    a. If so, then how are they integrated into the network?
    b. If not, why are they disconnected from individuals recorded in *S*?

Ultimately, examining whether traces of Kolskeggr's influence appear as distinct entities in network graphs provides insight into how ON-I oral and written sources were compiled into new narrative forms.

4.1 Methodological Considerations for a Social Network Analysis of Kolskeggr's Contribution in Sturlubók

To visualise Kolskeggr's section, individuals referenced in chapters S288-S335 are given a 'yes' designation in the 'Kolskeggr' column of the attestations sheet in the database indicating they are a part of his contribution (see 2.6.1.b). This classification does not prohibit individuals from being mentioned outside of this narrative subunit. Individuals not mentioned in Kolskeggr's section (S1-S287; S336-S399) are given the 'no' attribution. Having a 'no' distinction does not prevent these individuals from interacting with those mentioned in Kolskeggr's section.

Two more categorisations, 'in_and_out_of_Kolskeggr' and 'only_Kolskeggr', allow the composition of Kolskeggr's section to be compared to the population of the entire network. If an individual is referenced in S288-S335 and also appears in other narrative units, they are given 'yes' values in the 'in_and_out_of_Kolskeggr' column. People who are only referenced in Kolskeggr's section or exclusively in any other narrative units are given a value of 'no'. For example, Gnúpr appears in chapter S329—in Kolskeggr's section, but he also is referenced in chapter S365—part of the Southern Quarter narrative unit, therefore, he is assigned the 'yes' value. Vémundr is only referenced in S329 so he is given a 'no' classification.

If an individual is only mentioned in Kolskeggr's subunit, they are given a 'yes' value in the 'only_Kolskeggr' column. All other individuals are given a 'no' attribute. In this instance, Vémundr would be assigned a 'yes' attribute and Gnúpr would be ascribed a 'no' value (S329, S365).

4.2 A Conceptual Framework of Settlement

Kolskeggr's contribution is mostly integrated into the main narrative network subcomponent indicating that his section emerges from the same conceptual network as Sturla's.[72] Figure 36 is a visualisation of the main narrative subcomponent partitioned by individuals who are/are not referenced in his contribution. The enlarged, red nodes represent the 332 individuals (10.67%) mentioned Kolskeggr's section; all the grey nodes in Figure 36 indicate individuals not mentioned in his contribution (2,780, 89.33%). A significant number of red nodes are either directly connected to the main subcomponent of *S*'s narrative network or are attached via intermediaries.

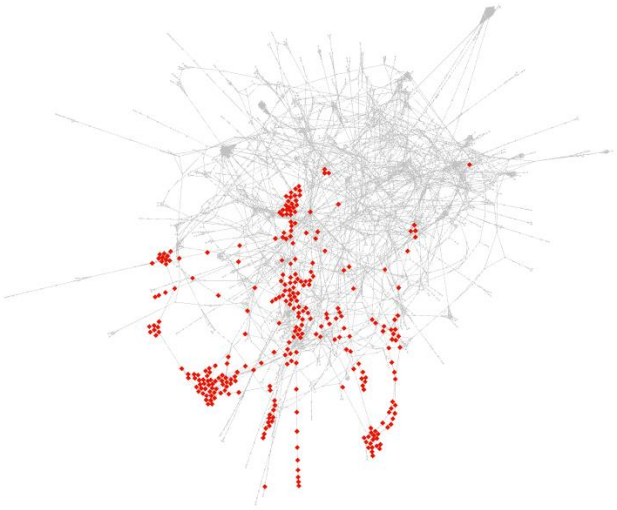


Figure 36 Nodes of individuals referenced in Kolskeggr's section of Sturlubók

[72] A component of a graph is a connected subgraph which is not part of any larger graphs. The main subcomponent of *S* is the largest independent graph which has the largest population and most representative of the narrative network. Individuals and groups that are mentioned in Kolskeggr's segment but are disconnected from the main subcomponent and visualised as smaller subcomponents are discussed in 4.4.1.

This pattern suggests that Kolskeggr conceptualised individuals, their relationships, and land-claims in a coherent framework of cultural memory. These geo-social relational elements serve as *Erinnerungsfiguren* 'figures of memory', fixed points which structure the transmission of cultural memory through narrative form—both oral and written (Assmann 1992, 37-42; 1995; Long 2017a, 58-9). Sturla placed and organised these figures according to the collective understanding of the *landnám* which enabled Kolskeggr's memories of settlement to 'communicate' with land-claim contributions from other compilers (Assmann 1995, 127).[73] The continuous rearrangement of *landnám* memories assigns 'meaning to the group's past and give[s] relevance to the group's present and future' because they can be reinterpreted to suit contemporary needs (Hermann 2010; Long 2017a, 59). Yet this is only achievable because figures of memory serve as the constants that narratives can be built around.

Creating an abstract framework to interpret a society's past relationships is also a collective process. How Kolskeggr's section slots into the overarching network of *S* supports what Slavica Ranković (2006b, 42) has labelled as 'distributed authorship' where ON-I texts are produced by a 'network of authors (oral story-tellers, writers, scribes)' which evolves over time. These authors create pieces that can be understood within the context of the audience, but it is not only limited to the oral or written material at hand, but also speaks to the culture on whole, beyond the text. Thus, different pieces of work can be threaded together because they are products of the same community.

This process leads to 'the remarkable representational complexity and realism of the sagas' (Ranković 2006b, 42) and *S.* Individuals and their relationships can clearly be identified and at least compared to modern frameworks of understanding even if modern audiences cannot fully interpret what all these social interactions meant. These elements can still be understood in the modern mind; therefore, the network of *S* can be reconstructed using

[73] See Hermann (2013) on how sagas not only have, represent, and mediate cultural memory, but are cultural memory in themselves. These concepts can be applied to *S.*

SNA. If ON-I texts were based on a completely foreign framework of relationships, then the connections and individuals could not be visualized or interpreted in comparison to modern understandings of medieval Icelandic society. Yet, this thesis cannot be considered as part of the original network of authors because it is not creating the network of *S* for its intended audience. It is not privy to all the socio-political elements informing what relationships are recorded in *S* or have the lived experienced of the medieval Icelandic cultural *milieu.* Rather, it reimagines individuals and relationships and constructs a pastiche of the social network in *S* to aid a modern audience in conceptualising social relationships and individuals in the past.

4.2.1 Working within a Framework: Kolskeggr's Conceptualisations of Individuals and their Relationships in *Sturlubók*

Chapters S316, S317, and S318 discuss the sons of Heyjangrs-Bjǫrn—Ásbjǫrn, Helgi, and Gnúpa-Bárðr—whose families claim land in the Jǫkulsá estuary in the north of Iceland. Of these three, Helgi has the shortest land-claim narrative and only the minimum amount of information is given about him, *Helgi hét maðr, annarr son Heyjangrs-Bjarnar; hann fór til Íslands ok bjó at Rauðalæk. Hans son var Hildir, er Rauðlækingar eru frá komnir* 'There was a man named Helgi, second son of Heyjangrs-Bjǫrn. He went to Iceland and made his home at Rauðalœkr. His son was Hildir, from whom, the *Rauðlækingar* [*Rauðalœkr* people] are descended' (S317). Yet, there is still enough relational material in his land-claim narrative to connect him with other kin members in the conceptual framework of the *landnámsöld* because it is compatible with other figures of memory.

Helgi's location in the narrative subnetwork is labelled in Figure 37. Helgi is linked to the main narrative network subcomponent via individuals mentioned in his chapter, particularly his father, Heyjangrs-Bjǫrn, who also appear in different narrative units in *S*.

His enlarged blue node is identified by the label and arrow in Figure 37. If the individuals in Helgi's chapter had no relationships outside of this chapter,

he and the other nodes would be detached from the main subcomponent and visualize as an independent cluster (see 4.4.1). Even in this case the disconnected small network subcomponents are considered part of the overarching framework because relationships are conceptualized and connect in the same way and if new relational information was presented, Helgi and his connections could be attached to the main subcomponent.

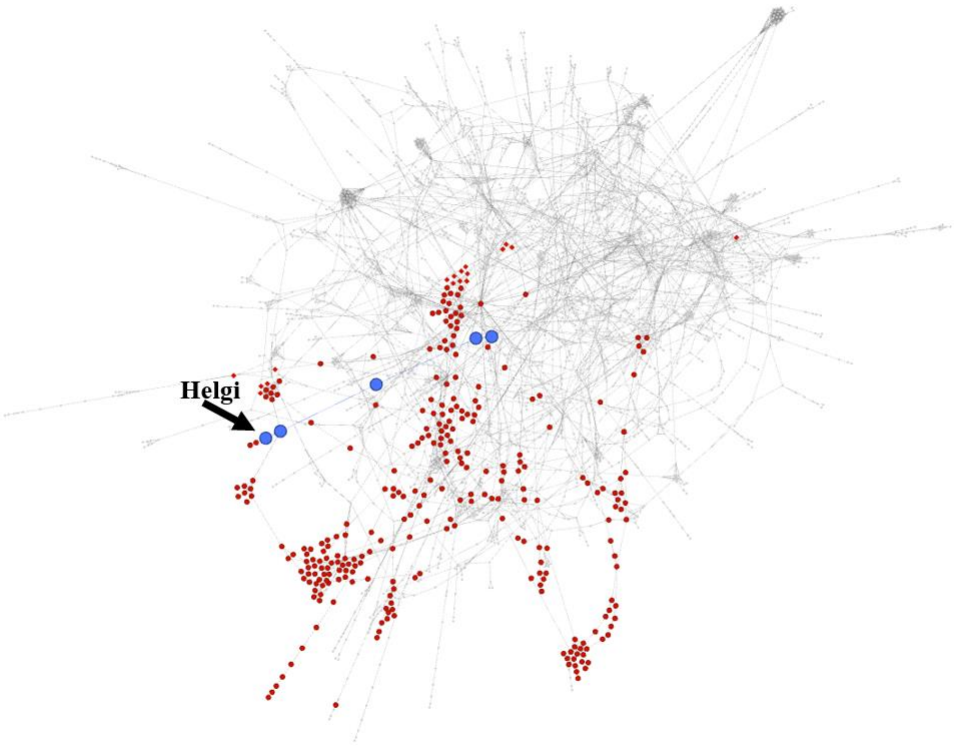


Figure 37 Helgi's location in the main narrative network subcomponent

The sequence of Heyjangrs-Bjǫrn's sons *landnám* narratives in the text—Ásbjǫrn's (S316), Helgi's (S317) and Gnúpa-Bárðr's (S318)—clearly indicate that these men are at least half-brothers. However, Helgi, Gnúpa-Bárðr, and Ásbjǫrn, are confined to their own micro-accounts of settlement and are not referenced in each other's narratives (S242, S316, S317, S318). Since relationships are entered on a chapter-by-chapter basis—see 2.4.1—Helgi's node is not directly connected to his brothers' nodes in the network. This can be seen in the spacing between Helgi's node (blue) and those of his brothers which are indicated by the purple arrow in Figure 38. Nevertheless, Helgi can

still easily access his brothers because each of these three men have a father-son relationship with Heyjangrs-Bjǫrn, blue node next to Helgi.

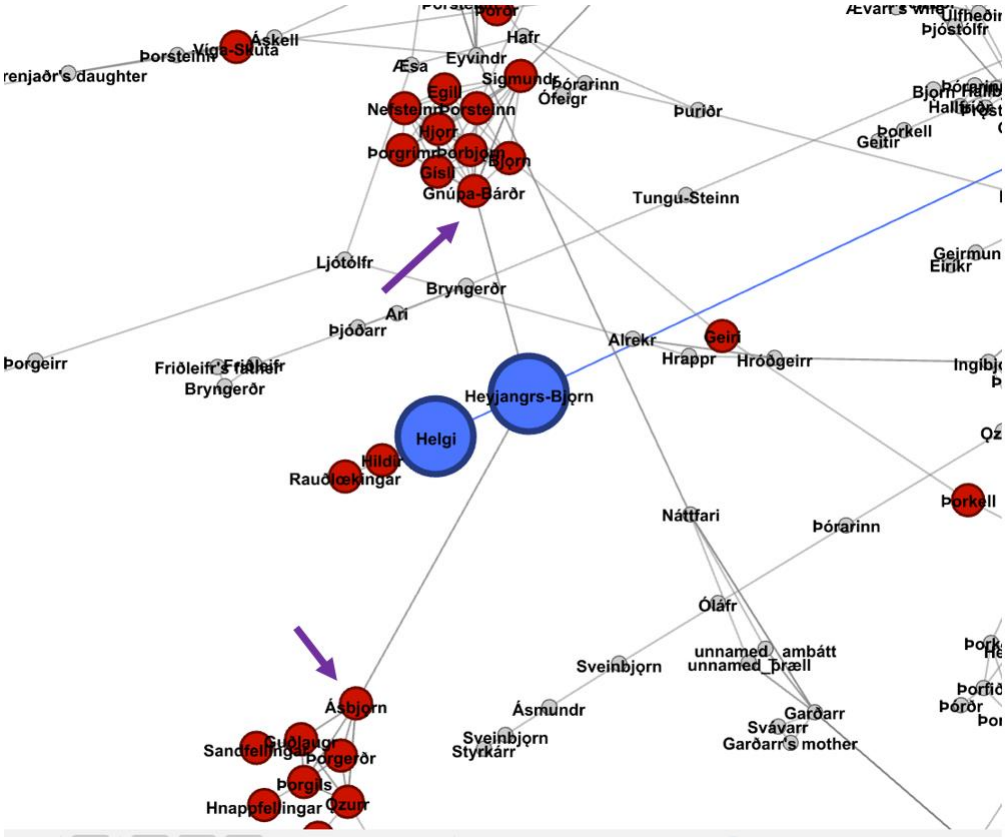


Figure 38 Magnified area of Helgi's location in the main narrative subcomponent

How the network connects individuals and visualises the results potentially emulates how relationships could be formed or rearranged with piecemeal information. For instance, if the brothers' chapters were not in sequence and placed in different locations in *S* and an individual knew that Helgi's father was Heyjangrs-Bjǫrn and then received oral or written evidence that Heyjangrs-Bjǫrn was also the father of Gnúpa-Bárðr and Ásbjǫrn, a mental kinship link could still be created, even though there are no attestations of all three children together in the same chapter. Then based on the information at hand, it could be assumed that Helgi, Gnúpa-Bárðr, and Ásbjǫrn are at least half-brothers and share the same patrilineal lineage. This common heritage, which is not always directly expressed in *S*, but commonly understood is what connects Helgi to the overarching network and his kin.

As mentioned, if Helgi's father was not mentioned in his land-claim chapter, Helgi and his direct connections would be detached from the main narrative subcomponent and appear as a smaller subcomponent on visualizations. Furthermore, this means that he and his descendants could not tap into Heyjangrs-Bjǫrn's ancestry which is firmly entrenched in the cultural memory of settlement. In S317, Helgi's genealogy only ascends as far as his father, but if the relationships from his brother Ásbjǫrn's and his sister-in-law, Þorgerðr's land-claim narrative are conceptually linked to Helgi, he can trace his patrilineal lineage directly to Bjǫrn *buna*, *Ásbjǫrn hét maðr, son Heyjangrs-Bjarnar hersis ór Sogni; hann var son Helga Helgasonar, Bjarnarsonar bunu* 'A man called Ásbjǫrn, son of Heyjangr-Bjǫrn's *hersir* of Sogn; he was son of Helgi son of Helgi, son of Bjǫrn *buna* (S316).

Bjǫrn *buna* is a/the pseudo-mythical forefather being the ancestor of some of the most prominent settlers of Iceland in addition to a sizeable amount of the general population of *S* (S11 see 5.4 and 5.5.3.b.i). Consequently, this means that many individuals can claim ancestry from him—whether through legitimate or spurious means. Therefore, Helgi, although positioned on the periphery of the network, which indicates that he is not an important individual, has a direct path to one of the conceptual linchpins of the network, Bjǫrn. Helgi's path to Bjǫrn only takes four steps, which is shown by the blue nodes connected by the blue edges in Figure 39 where Helgi is represented by the leftmost node and Bjǫrn, the rightmost. This is strong evidence for certain individuals like Bjǫrn and King Haraldr serving not only as figures of memory from a relational standpoint, but also from a temporal 'then' and 'now' dichotomy, where they represent the historical and mythical past in the homelands versus the present in Iceland. To create a linear narrative in a non-chronological source, people could attach their genealogies to one or multiple of these foundational figures, regardless of if they ever set foot in Norway, to provide some sort of context for their present way of being through overarching shared origins. Thus, Helgi, despite being geographically distant from other contemporary descendants of Bjǫrn like Auðr *djúpauðga,* who settled in the Dalir region in western Iceland, can still be mentally linked to them using the past if needed for contemporary or future concerns.

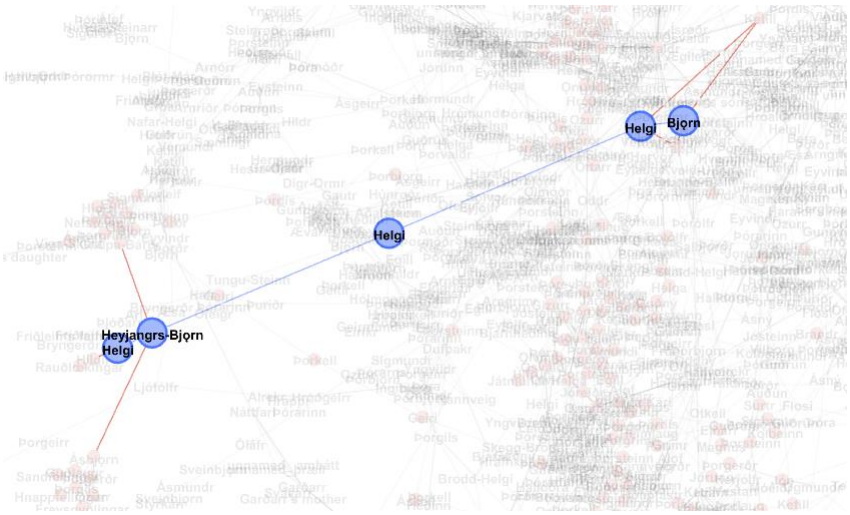


Figure 39 Path showing how Helgi's node is connected to the main network subcomponent

Therefore relationships, genealogical and geographical threads in *S* could be mentally woven together, unravelled, or cut entirely depending on the strand of cultural memory the compiler wanted to weave. However, these cultural fibres are fragile and finite: there are boundaries to how far the compiler can manipulate and fabricate genealogical and topographical patterns before they become unrecognizable.

Incongruent conceptualizations of place and social relationships existing outside of the expected medieval Icelandic societal norms like hierarchical relationships from a non-Christian or non-European society could not be directly imported into the conceptual framework. They would either disrupt the Icelandic system or be reformatted and no longer serve their original purpose in a new context. Furthermore, inconsistencies in genealogical source material—an incorrect name, place, or relationship—must be mediated by the compiler and they would have to make structural choices which would not disrupt the conceptual framework.

4.2.2 A Part of the Whole: How Kolskeggr's Section Interacts at the Network Level

How Kolskeggr's contribution 'communicates' with the rest of the text at the network level can be seen in Figure 40. Figure 40 is a visualization showing what individuals are recorded in Kolskeggr's section and in another narrative unit in light blue. The pink nodes represent individuals only referenced from S288-S335 and nowhere else in *S*. All other grey nodes signify individuals not mentioned in this selection of chapters. The graph looks almost divided with the collective group of pink and light blue nodes only visualising in the bottom half of the graph. This is explained by geographical networks because the top half of this graph corresponds to the Western Quarter narrative and geographical unit (see graphs below). Considering Kolskeggr's section canvases the east coast of Iceland, it is unsurprising that people mentioned in his contribution have almost no relationships with people associated with the Western Quarter, which is the most distant region in relation to the east (see Figure 12).

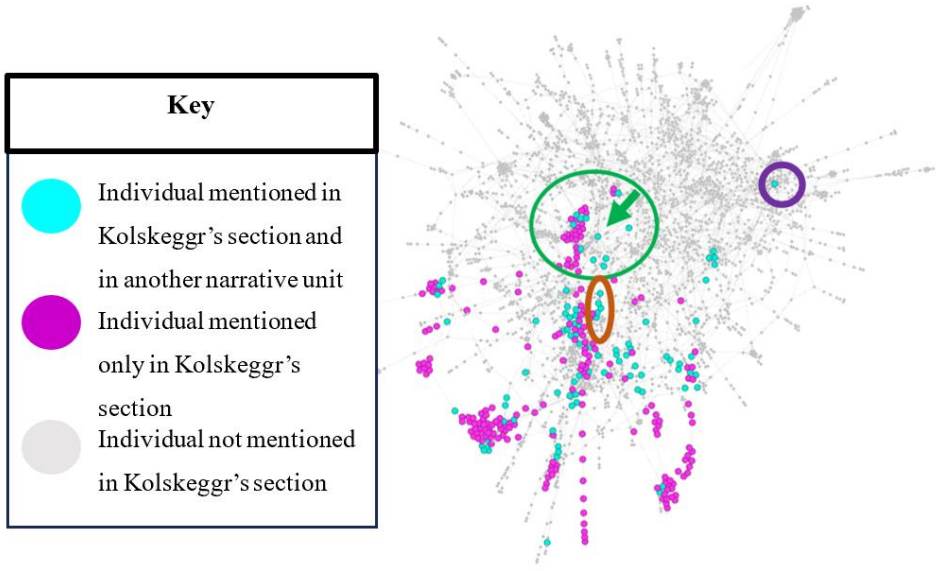


Figure 40 Individuals mentioned in Kolskeggr's section and in other narrative units

Many pink nodes exist on the periphery of the graph and are attached to the main subcomponent through an intermediary, a blue node who is outside of Kolskeggr's contribution. Yet many pink and blue nodes still cluster together

around the outer edges of the graph. This indicates that many individuals from the eastern coast or associated with Kolskeggr's section are not central figures in the network. Again, this could be attributed to the physical distance of the East from the central authority, *Alþingi*, and other powerful individuals. Nevertheless, there are some exceptions to this general pattern.

Despite only referenced in Kolskeggr's section, Hrollaugr, the son of Jarl Rǫgnvaldr and a leading settler of the Eastern Quarter, is centrally located in the graph as part of the cluster circled in green (S305, S309-S315, S335). His strong relationship with King Haraldr, 'pulls' his node closer to the centre of the network, which in turn moves Hrollaugr's and his connections' nodes away from the Eastern Quarter region of the narrative network (see 2.2.1.a). King Haraldr is at the centre of the network because he has the large number of relationships—both positive and negative—across *S* (see 5.5.2.a.i). King Haraldr's node is identified by the green arrow in Figure 40.

The orange circle directly below the green circle, contains a string of light blue nodes. This group is comprised of individuals associated with the Sturlusynir, a powerful thirteenth century family group of which Sturla Þórðarson was a member, who can claim direct descent from Hrollaugr (see 6.6.1.b for more on the Sturlusynir). It is not surprising that they are found in proximity to the king or their illustrious ancestor and are central to the network. Since this family has far-reaching connections particularly in the North and West of Iceland, they can also serve as bridges for individuals in Kolskeggr's section to reach the main subcomponent of the network. This could also make the audience perceive the Sturlusynir as facilitators and power brokers with historical claims and interests across all of Iceland, not just in the areas of their physical homesteads.

There is also an interesting outlier of a singular blue node, circled in purple, in Figure 40 which represents Hrafnkell *goði*. Regardless of having no connections with other individuals referenced in Kolskeggr's section, his node visualises light blue. This can be explained because his only attestation between chapters S288-S335 is in S335. This chapter is unique because it is a 'conclusion' chapter listing the greatest settlers and individuals in the Eastern

Quarter (see 3.2.2.b). Hrafnkell's lack of association with other individuals mentioned in Kolskeggr's section, other pink and blue nodes, support observations that Sturla inserted these chapters to help frame the text. If these textual organising devices were originally inserted by Kolskeggr or other compilers, it would be assumed that Hrafnkell would have more connections with people in Kolskeggr's area of influence. Additionally, the position of Hrafnkell relative to where Kolskeggr's unit clusters on the graph indicates that he could be part of a smaller local community of the Eastern Quarter which is disconnected from the main community. Looking at where Hrafnkell settles in comparison to the spread of eastern coastal settlements associated with Kolskeggr, it is likely that he belongs to a different geosocial group.

Hrafnkell settles inland in Hrafnkelsdalr show in Figure 41 (S283). His farm is surrounded by *landnám* farms that are enumerated in the Eastern Quarter narrative unit, but not as part of Kolskeggr's narrative subunit. These farms are not only distinct from a narrative structure-perspective, but also geographically. They are all concentrated in Fljótsdalr and Hrafnkelsdalr, whereas those in Kolskeggr's section are on the eastern coast of Iceland. Additionally, outside of the Eastern Quarter conclusion chapter, information about Hrafnkell and his descendants is not recorded in Kolskeggr's narrative subunit. The topographical and narrative evidence suggests that a different source provided information for Hrafnkell's *landnám*, not Kolskeggr. Furthermore, including the conclusion of the Eastern Quarter, S335 as a part of Kolskeggr's section in SNA produced this outlier. Therefore, in future applications of SNA to Kolskeggr's section, Kolskeggr's unit should be from S288-S334.



Figure 41 Settlements in the Eastern Quarter

4.3 A Matter of Style?: Does Narrative Description Impact the Visualization of Individuals and their Relationships in the Narrative Networks of Sturlubók?

Sturla, and other *Ldn* compilers, use figures of memory, e.g. personal and place-names, as vehicles to interpolate saga material and anecdotal information in land-claim narratives. On the other hand, Kolskeggr's section is noticeably more laconic and only rarely includes auxiliary information or saga material. Therefore, it is not always entirely clear why some individuals and places are given extensive historical, social, or political backgrounds and others are not, but in these instances where context is provided, the past functions as 'an entity working as an argument for present and future conditions' (Hermann 2010, 74).[74] Infusions of verisimilitude in the form of 'historical' facts—real or invented—and awareness of 'then' versus 'now', create a cohesion with the past and a thread into the future by 'orienting' contemporaneous opinions of *S*'s audience about places and/or families (Hermann 2010, 75-81).[75]

The most recognizable attempt to orient contemporary society's views in *S* is with Ingólfr's depiction as a 'noble heathen' and the prioritization of his land-claim. For example, prioritizing Ingólfr's land-claim and presenting him as a 'noble heathen' by comparing him to his non-practicing blood-brother, Hjǫrleifr, enabled the now-Christian Icelanders to unproblematically claim descent from a pagan ancestor.[76] Yet, these anecdotal elements are superfluous regarding the construction of the overarching narrative of settlement, and in

[74] Many scholars have speculated on the inclusion of pre-*landnám* material in *Ldn* i.e. exploits in Norway. For example, Geirmundr *heljarskinn*, a settler of noble origins who lived at Geirmundarstaðir, has been the focus of many of these debates. His activities in Norway have been preserved across the ON-I corpus—*Geirmundar þáttr heljarskinns* and in multiple redactions of *Ldn*—this suggests that the account of his *landnám* existed well before the thirteenth century (for dating see Úlfar Bragason 1993; Guðrún Nordal 2010). Recently, Helgi Þorláksson (2012) has demonstrated that Geirmundr's role as an ancestor figure highlights the contemporary interests of the Skarðverjar or Melamenn, who are connected to the compilation of the *M* redaction of *Ldn*. Thus, in this instance there appears to be a reason for including his pre-*landnám* activities in Norway. However, since attempting to reconstruct the rationale for including pre-*landnám* exploits of particular settlers is by nature speculative, it will only be discussed here on if there is scholarly consensus of a particular interpretation or if pre-*landnám* material contextualises SNA analysis.

[75] See Hermann (2010) for discussion on 'Now' and 'Then' relations.

[76] See Lönnroth (1969) and Höfig (2017) for more on the 'noble heathen' trope and how Ingólfr serves as an archetype.

turn, its social network. Depicting Ingólfr as *var frægastr allra landnámsmanna* 'the most famous of all the setters' only contextualizes and orients the reader's perceptions of his *landnám*, it does not structure it (S9). Instead, 'geography, in conjunction with genealogy, provided a robust and tangible framework to organize narrative material' (Lethbridge 2016, 56). In this way, stories can be built upon physical or saga landscapes, and populated with individuals from historical or mythical genealogies because the locations and characters whether 'real' or 'invented' are derived from a shared memory of settlement. Thus, to have a narrative effect, Ingólfr's high-seat pillars need to come ashore at a place that is mentally mapped at a societal level. His characterization as 'noble heathen' can only be established because *fostbræðir* is a recognised relational term and state of being within the medieval Icelandic social construct. Therefore, places, people, and relationships are the entities serving as the foundations of a conceptual and narrative network. These 'fixed' figures of memory facilitate linkages across disparate settlement compilations because they enable land-claim narratives to 'communicate' with each other.

This is further evidenced by relationships, individuals, and places from Kolskeggr's notably laconic section which not only near seamlessly integrates in the textural structure of *S*, but also in its narrative network (see Figure 36). The lack of high-seat pillar stories and paucity of editorial changes by Sturla or other compilers in the East simply does not impact Kolskeggr's chapters from interacting with other sections of *S.* If anecdotal information was a prerequisite for entry into the social framework of settlement or used to organize the text; individuals, and their relationships in Kolskeggr's section would visualize as disconnected, independent clusters in network graphs. Instead, most of the population in his chapters are attached to the main narrative subcomponent. So, although he has a distinct style, it does not impact the creation of a narrative of settlement because Kolskeggr is using figures of memory: place-names, personal-names, and relationships in a coherent framework used to memorialize settlement.[77] Therefore, all other information in *S* is purely

[77] This could also be said of created settlers to fill the landscape where a name is only needed to remember the location and vice versa see 5.6.

supplemental indicating Kolskeggr's section simply differs in style, not in how the settlement was conceptualized.

4.3.1 The Impact of Terseness

What is impacted by Kolskeggr's terse style is the audience's interpretation of these figures, the probability of inclusion in the main subcomponent of the narrative network, and the shape his section takes in the network. Naturally, 'descriptions of the Icelandic landscape are historically and culturally contingent' and this extends to characterizations of people and their connections (Kedwards 2020, 133).[78] Kolskeggr employs the same relationships as other compilers and attaches these connections in a similar way, but unlike Sturla he often provides no context for these elements. Each of these figures of memory are inherently imbued with meaning, but with no narrative markers or anecdotes inserted to orient how to perceive a place, person, and/or relationship, the audience is left to ascribe their own meanings through the lens of their personal interests, not the compilers. This could be seen as a more 'historical' method introducing these structural components in a straightforward manner to reduce partiality, but this is speculative and cannot be analysed at present.[79]

The number of individuals and relationships mentioned in a chapter also impacts the chances of an individual's inclusion into the main network subcomponent. On the whole Kolskeggr's chapters feature fewer individuals, more family groups, and a smaller range of available relationship types—which are still compatible with those from outside his section. The combination of these factors increases the likelihood that relationships within a chapter will visualize as its own narrative subcomponent independent of the main network subcomponent see below. This is unless one of these individuals already is connected to the main component via their relationships from elsewhere in the

[78] For example, of how places are perceived at different points in time see Callow's (2006) comparison of how western Iceland is treated in *Laxdæla saga*, in comparison to *samtíðarsögur* 'contemporary sagas'. See also, Stevens (2011) on Skalla-Grímr's land-claim across the ON-I corpus.
[79] It can be argued that the act of inserting certain individuals at the expense of others, is a form of selection bias.

text, which a significant number of individuals do have evidenced by Figure 39. This pattern could be impacted by the thesis' methodology because relationships are recorded by chapter and not connected over multiple chapters (see 2.4.1). If a cross-chapter linking approach was used, perhaps more relationships would visualize between Kolskeggr's section and the rest of the text. However, this would simply prove further that relationships from this narrative subunit are compatible with those found elsewhere. Secondly, the thesis' approach of treating each chapter as an independent entity better reflects that *S* was produced through a compilatory process with information coming from different regions and sources. Cultural knowledge from Kolskeggr could have been more limited or presented in a distinct style; how his portion of *S* visualizes in the network with more independent sub-components which are still part of the overarching narrative network emulates this process.

4.3.2 Occasional Description

Although Kolskeggr's contribution is noted for its brief accounts, it is not devoid of descriptive narration and some land-claim narratives are more stylistically like the rest of *S* than his near 'formulaic' chapters. For example, the settlement of Loðmundr *enn gamli*, a sorcerer, is treated in exhaustive detail. He is mentioned throughout several chapters and even has two land-claim narratives in Kolskeggr's section S289 and S333 as well as an entire chapter dedicated to his descendants, S334 (see also S290, S320, S332, S337). From these multiple attestations we are given a sense of who Loðmundr was, but perhaps the main reason to emphasis his narrative is because his dispute with Þrasi resulted in the establishment of the Southern and Eastern Quarter boundary.

Hrollaugr's land-claim narrative is also infused with description (S309-S310, see 5.3.1.c.ii). Hrollaugr is the son of Jarl Rǫgnvaldr and friends with King Haraldr and becomes one of the most outstanding settlers of the Eastern Quarter. This demonstrates that Kolskeggr could also shape socio-political perceptions of individuals based around the eastern coastline through anecdotal evidence reflecting that person's influence. Alternatively, Kolskeggr could

have used Hrollaugr and his land-claim to fill the region and flesh out the narrative between S316-S318, an area that not many individuals know about.

Another interpretation of the descriptiveness of Hrollaugr's land-claim is that this is one of the few areas that Sturla manipulated in Kolskeggr's section. Sturla's family descends from Hrollaugr and he can create historical connections between his family and King Haraldr via the friendship between the king and Hrollaugr (see Figure 114). In this model, Sturla does not change the figures of memory supplied by Kolskeggr or other Eastern Quarter compilers because they are already established in the conceptual network of settlement. Rather, he can construct micro-narratives around fixed figures of memory; people, their relationships, and places to orient the perception of these elements. He cannot completely rewrite the location of Hrollaugr's settlement or change who Hrollaugr's father is because physical position of places and people associated with them already serve as mnemonic referents helping structure the narrative (Lethbridge 2016, 77; see 3.1). Therefore, Sturla must stay within the pre-established narrative and conceptual boundaries structured by the Icelandic landscape; Hrollaugr must settle in Hornafjǫrðr. Sturla can add context and other locations Hrollaugr stopped at to highlight his geographical control over the region, but they must be topographically linked to the fixed figure of memory—Hornafjǫrðr. If Sturla tried to move Hrollaugr's settlement to, say, the Southern Quarter, it would be incongruent with the conceptual framework. But Sturla can expand on details of Hrollaugr's friendship with King Haraldr which in turn would make individuals mentally perceive their relationship as stronger because this does not change the pre-established figures of memory.

4.4 Visual Analysis: Evidence of Kolskeggr's Hand?

Although Kolskeggr's contribution connects to overarching narrative of settlement, his influence is not invisible in the network. The shape of his section is distinct in comparison to other narrative units. On the left side of Figure 42, there is a graph which visualises individuals in Kolskeggr's contribution as enlarged, red nodes. The other nodes in the figure are coloured

according to where the individuals appear in other narrative units (see 3.4). The pink nodes represent individuals mentioned in the Western Quarter, green nodes the Northern Quarter, and light blue nodes the Southern Quarter. The other areas of the graph are more compact, Kolskeggr's section is narrower, more dispersed, and rife with structural gaps. Additionally, a higher proportion of individuals and groups referenced in his section are not attached to the narrative network (see below). This is ultimately attributed to the topography and relative location of the Eastern Quarter to the other Quarters as well as there being generally fewer people documented from the East.

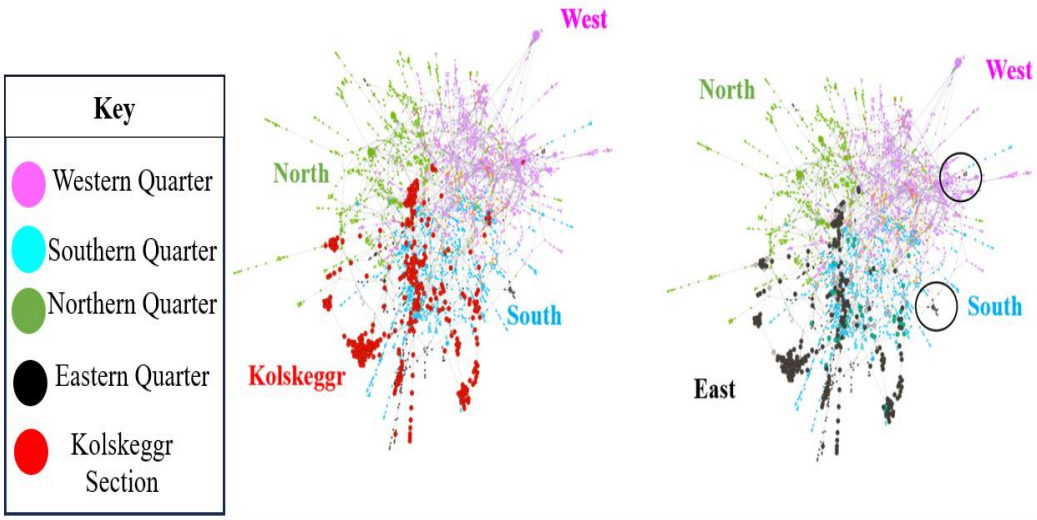


Figure 42 Network partitioned by narrative unit of reference with nodes of individuals in Kolskeggr's sub narrative unit recoloured (left), Network partitioned by narrative unit of reference (right)

The overlap between Kolskeggr's section and the Eastern Quarter narrative unit can be seen when comparing their distribution of nodes in Figure 42. The right visualisation in Figure 42 recolours all nodes based on narrative units(s) of appearance, including those referenced in Kolskeggr's unit; however, these nodes retain their larger size as a distinguishing feature. On the right graph the red nodes are replaced by black nodes representing individuals only mentioned in the Eastern Quarter, teal nodes for those in both Eastern and Southern Quarter sections, and grey nodes indicating another combination of multiple narrative units. The spread of the Eastern Quarter almost exactly follows the dispersal of nodes mentioned in Kolskeggr's section. This is unsurprising because his chapters comprise the largest sub-section of the Eastern Quarter and most people belonging to this Eastern Quarter in *S* are

more likely to interact with individuals from their own Quarter before others i.e. individuals referenced in Kolskeggr's section. Therefore, it can be said that the spread of the Eastern Quarter and Kolskeggr's sections are influenced by many of the same factors.

The Eastern Quarter is the most geographically distant from the other regions of Iceland and physical centres of power, notably the Alþingi. This is evidenced by Hrafnkell's, *sjautján dagleiðir á Þingvǫll* 'seventeen-day journey to Þingvellir' in *Hrafnkels saga Freysgoða* (ÍF XI, Hrafnk 3).[80] Whether this journey is unusual or not, it highlights the perceived geographical distance between the East and a centre of power. This physical space would also impose limits on what could be added or manipulated to the conceptual framework because unfamiliarity with the region could lead to inserting incorrect information which would then call into question the credibility of the compiler. Considering that Sturla Þórðarson is largely associated with all the other Quarters of Iceland and his strongest genealogical connection to the east is Hrollaugr, it is probable that he did not have a deep understanding of the geopolitical situation in the east of Iceland. This would restrict him from adding commentary to many of eastern settler's *landnám* narratives because if he included incorrect information or changed relationships and rendering them unrecognisable it would bring his credibility as an authority into question. Thus, he could only connect many of these individuals and their relationships to their locations in the conceptual framework of settlement, relying on other informants from or associated with the east like Kolskeggr to provide the information. Additionally, preserving Kolskeggr's writing style for this region, makes this information appear more 'authentic'. By not completely altering the prosaic style to match his own personal writing, Sturla is confirming not only through words, but through action that this knowledge is coming from Kolskeggr *enn vitri* 'the wise', a credible source.

This is not to say that all individuals in the East are associated with his unit, there are some small clusters of black nodes which are not enlarged indicating that these are mentioned in the Eastern Quarter section, but not in

[80] This Hrafnkell is a descendent of the settler Hrafnkell *goði*.

Kolskeggr's section. The upper black circle on the right graph in Figure 42, encompasses a small cluster comprised of individuals from Hrafnkell *goði*'s family who were discussed above. The lower cluster of black nodes is largely made up of people referenced in chapter S270.

Chapter S270 traces the genealogy of the Vápnfirðingar kin group starting in Norway with the foundational figure Øxna-Þórir (see 3.6.2 and Figure 35). The lineage descends from Øxna-Þórir to his son, Ósvaldr, father of Ǫlvir *enn hvíti* who moves from Álmdalir to Yrjar both in Norway after falling out with Jarl Hákon. His son Þorsteinn *enn hvíti* decided to leave Norway entirely and migrated to Iceland and acquired land in Vápnfjǫrðr, *eptir landnám* 'after the settlement [period]' through purchase and claiming payment of debts. Þorsteinn was the father of Þorgils, Þórðr, Ǫnundr, Þorbjǫrg and Þóra. Þorgils was the father of Brodd-Helgi, father of Skegg-Broddi, father of Þórir, father of Guðrún, mother of Bjarni, father of Bjarni *prestr*, father of Guðrún *er Þórðr Sturluson átti* 'who Þórðr Sturluson married'.[81]

The separateness of this group is likely attributed to their connections outside of the Eastern Quarter. The sub-cluster is approximately in the area of the graph where the Vápnfirðingar and Sturlungar's genealogies meet. This can be seen in Figure 43 where the red line shows the connection between Þorsteinn *enn hvíti* and his descendants Bjani *prestr* and Guðrún identified by the orange arrows and men of the Sturlungar who are identified in blue. Guðrún is the bridge between her husband Þórðr and the Sturlungar, and her father Bjarni and the Vápnfirðingar (see 6.5.2). Her node is being pulled toward the Western Quarter, the base of the Sturlusons, from the East and with it the cluster of her siblings and relatives. This attraction explains why Þorsteinn *enn hvíti* and the Vápnfirðingar are originally located in the part of the network which corresponds to the southeast and eventually moves to a new area reflecting how political relationships change over time and become less regional.

[81] This is not Sturla Þórðarson mother. Sturla was the son of Þóra, a concubine of Þórðr.

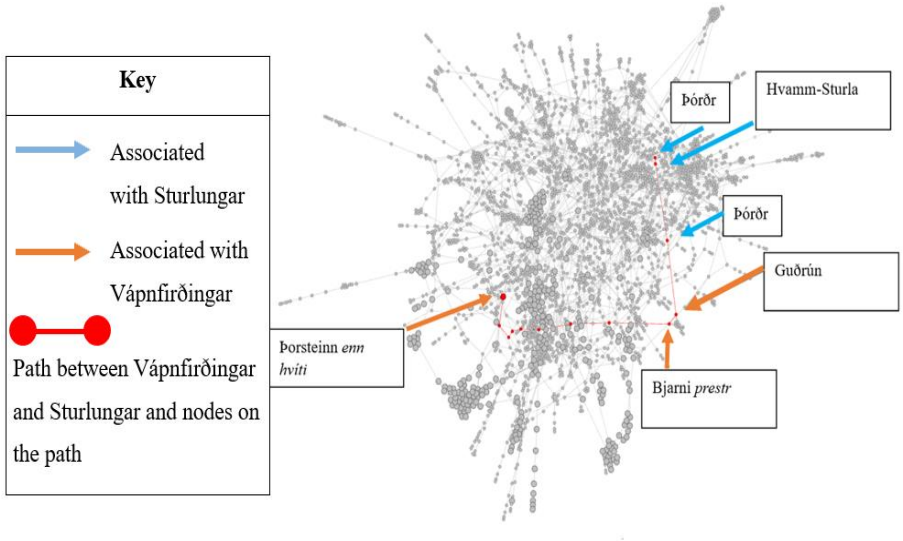


Figure 43 Location where the Vápnfirðingar and Sturlungar's genealogies meet in the narrative network

4.4.1 Disconnected: Groups in Kolskeggr's Section Disconnected from the Main Network Component

Twenty-eight kin groups are mentioned in Kolskeggr's section, and their names are listed below in Figure 44. Seventeen of these groups are connected to the main network subcomponent and their locations are represented by the dark red nodes in Figure 45. Eleven kin groups visualize as independent clusters not connected to the main subcomponent like the Háleyglagaætt, Krossvíkingar and Kyrmlingar in Figure 46.

Group names mentioned in Kolskeggr's contribution	
In Main Subcomponent	**Independent Genealogies**
Mýramenn	Húsvíkingar
Sandfellingar	Nesmenn
Hnappfellingar	Sandvíkingar
Rauðlœkingar	Viðfirðingar
Seyðfirðingar	Hellisfirðingar
Klǫkuætt	Krossvíkingar
Breiðdœlir	Krymlingar
Berufirðingar	Ǫlmœðlingar
Sturlusynir	Stǫðfirðingar
Rúðujarlar	Vœpnlingar
Englakonungar	Háleygjaætt
Þorsteinsbǫrn	
Móðólfssynir	
Lágeyingar	
Freysgyðlingar	
Hofsfellingar	
Hornfirðingar	

Figure 44 Group names in Kolskeggr's section

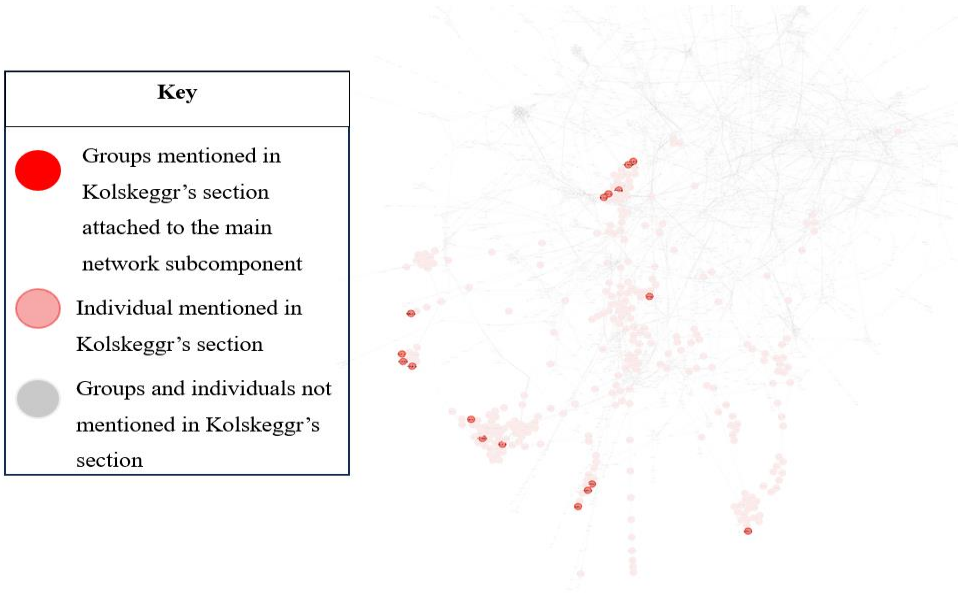


Figure 45 Kin groups in Kolskeggr's section integrated into the main subcomponent of the narrative network



Figure 46 Kin groups not attached to the main network subcomponent: Háleyglagaætt, Krossvíkingar and Kyrmlingar

Figure 47 is a map of the east coast of Iceland showing the corresponding geographical locations for each of these family groups. The *Englakonungar* 'kings of England', and *Rúðujarlar* 'jarls of Rouen' have been removed because they are based outside of Iceland. Additionally, the Sturlusynir and Lágeyingar are not shown because they are in different Quarters; and the locations of Hnappafell (Hnappfellingar) and Rauðlœkr í Öræfum (Rauðlœkingar) are not included because their coordinates are not available in ISM. Yellow markers represent groups who are attached to the main subcomponent and blue markers are those not attached.



Figure 47 Locations of kin groups mentioned in Kolskeggr's contribution

Most groups mentioned in Kolskeggr's section are concentrated on the northeastern coast of Iceland, but there are four yellow markers dotted along the southeastern coast which represent the Hornfirðingar, Hofsfellingar, Mýramenn, and Sandfellingar. The Hornfirðingar, Hofsfellingar, Mýramenn were established after one of their progenitors dealt with Hrollaugr and their chapters are sequenced next to each other in *S*. Ketill, *frá honum eru Hornfirðingar komnir* 'from who the Hornfirðingar descend from' bought land from Hrollaugr (S311). Auðun *frá honum eru Hofsfellingar komnir* 'from him the Hofsfellingar descend from' also bought land from Hrollaugr (S312). Þorsteinn also bought land from Hrollaugr and his son was Vestmarr, *er Mýramenn eru frá komnir* 'who the Mýramenn descend from' (S313). There is an emphasis on these men's purchase of land from Hrollaugr and it could be a way to firmly entrench them in the network without establishing them as dependent settlers (Sveinbjörn Rafnsson 1974, 179-80; see 5.3.1.c.ii). This link allows them to be centrally located in the network as well as have a roundabout way to be connected to King Haraldr.

The Sandfellingar, the Hnappfellingar, Rauðlœkingar, and possibly the Freysgyðlingar can confidently trace their ancestry to Heyjangrs-Bjǫrn, great-grandson of Bjǫrn *buna* (S316-S317). Heyjangrs-Bjǫrn's son Ásbjǫrn went to Iceland with his wife, Þorgerðr and their children. He died at sea leading Þorgerðr to become a *landnámskona*. Their son, Guðlaugr is the progenitor of the Sandfellingar. Another child of Ásbjǫrn and Þorgerðr is Þorgils, *er Hnappfellingar eru frá komnir* 'who the Hrappfellingar are descended from'. Their third child was Ǫzurr, who was the father of Þórðr *Freysgoði* who presumably is one of the progenitors of the *Freysgyðlingar* 'priests or worshippers of Freyr', although they are never explicitly linked in *S* (Gunnar Karlsson 2004, 220). From Hildir, another grandson of Heyjangrs-Bjǫrn's, the Rauðlœkingar come from. As mentioned, the exact coordinates of Hnappafell (Hnappfellingar), and Rauðlœkr (Rauðlœkingar) are not available, and the location associated with the Freysgyðlingar is unspecified in *S*, but based on their textual location they were probably rooted in southeastern Iceland.

The family groups based in southeastern Iceland are more likely to be connected to the main network subcomponent than from those from the northeast. This indicates that more information about these groups was known or available compared to their northeastern counterparts. As demonstrated, people in the southeast have links to important individuals—Hrollaugr and Heyjangrs-Bjǫrn—who function as fixed figures of memory that genealogies can be latched onto; whereas there is not an ancestral figure that people from the northeast can call upon. Indeed, there is a cluster of families on the northeastern coast of Iceland, represented by the concentration of blue nodes in Figure 47, that are disconnected from the main narrative network subcomponent.

Many of these group names in the blue cluster in Figure 47 are either formed from a place-name element e.g. the Húsvikingar after Húsavik or are named after their progenitor e.g. Ǫlmóðr and the Ǫlmœðlingar (S288, S296). These group names could indicate areas of the landscape which were artificially populated. If this is the case, terminating genealogy with a family group versus an individual's allows for more individuals to claim ancestry because more ambiguity and genealogical inventiveness is allowed when attaching oneself to a kin group identification versus a singular line of descent. Additionally, a number of these groups in the northeast like the Húsvíkingar, are unknown outside of *Ldn* suggesting a name was needed to fill an otherwise blank location (S288n6). But absence of evidence is not always evidence of absence and the Seyðfirðingar, despite also being unidentified in the rest of the ON-I corpus, connect to the main network subcomponent through their relationships (S290n2; see 4.2.1). So, the relationships of these groups might have been lost in the present, or more likely people in thirteenth-century Iceland were so familiar with these pedigrees that they did not need to be recorded. Even in the cases, their ancestors and members were unclear, the kin groups at a minimum would still be conceptually linked to the network of settlement whether 'invented' or 'real' and served a historical, political, or geographical purpose when *S* was compiled.

This is further supported because some of these group names do appear in other areas of the ON-I corpus suggesting some type of collective validity. *Þorsteins þáttr uxafóts* draws on *Ldn* as a reference and in chapter seven, lists Freysteinn as a *landnámsmaðr* as well as the progenitor of the Sandvíkingar and Viðfirðingar and Hellisfirðingar, which is consistent with *S*, although the rest of the chapter's plot is exaggerated (ÍF XIII, ÞUxaf 7; S293n6; Ashman Rowe 2003, 100). There is a continued collective association with these groups to the locations shown in the description of the topography and place-name history of Viðfjǫrðr (modern Icelandic Viðfjörður) by Örnefnastofnun which states *Þar börðust Viðfirðingar og Sandvíkingar eitt sinn til forna*, 'The Viðfirðingar and Sandvíkingar fought there in ancient times' in reference to the location, Vatnsmýri in the fjord (Guðmundur Magnússon 2). No more information is provided than this aside, but it demonstrates that these groups whether 'invented' or 'real' had some symbolism in the landscape.

There is also an absence of family names between Berufjǫrðr and Mýrar on the Eastern coast of Iceland which is indicated by the white bracket in Figure 47. This area corresponds to the chapters S303-S308, which lead up to Hrollaugr's land-claim, S309-S310. Like some of the group-name chapters, the settler of chapter S303, Bjǫrn *sviðinhorni* shares a name-element with one of the locations he settles, Sviðinhornadalr. This could indicate that he was inserted to fill the landscape as a phantom settler, see 5.6.1.a.

Chapters S304-S307 are associated with the settlers Boðvarr *enn hvíti*, Brand-Qnundr, Þorsteinn *trumbubein*, and Þórðr *skeggi*. Boðvarr *enn hvíti* was a *frændi* 'kinsman' of both Þorsteinn and Brand-Qnundr. Þorsteinn's genealogy terminates in Bishop Gizurr. Brand-Qnundr's genealogy is not listed, but it is said *ok er mart manna frá honum komit* 'and many great men are descended from him'. On the other hand, Boðvarr *enn hvíti*'s land-claim and ancestry is extensive compared to the rest of Kolskeggr's section. This is likely because his descendant Siðu-Hallr's genealogy was widely known in part because he is an ancestor of the Sturlusynir (S305n4).

S307 recounts Þórðr *skeggi*'s settlement and lineage. It is also a descriptive chapter by the Eastern Quarter's standard, which can be attributed

to two factors. Þórðr is the grandson of Bjǫrn *buna*, therefore, his genealogy would have been well-known, and we would have been associated with individuals at the centre of the theoretical network of settlement (see 5.4 and 5.5.3.b.i.). Furthermore, Þórðr only lived in the east for roughly ten years before he moved his farm west to the Southern Quarter to follow his high-seat pillars. Thus, Þórðr not only physically relocates, but also conceptually moves to one of Sturla's areas of geographical expertise. This is demonstrated by referencing Þórðr's land-claim in S11 in S307 with *sem fyrr er ritat* 'as written before'. This self-reference could also serve as a textual marker for the audience, explaining why these chapters have more geographical and social descriptions in an area Sturla might not have been considered an authority.

In S308, there is a return to a more laconic style; however, this chapter is of interest because it describes a 'failed' settlement. Þorsteinn *leggr* went to Iceland from the Hebrides and claimed all the land north of Horn to Jǫkulsá and lived at Bǫðvarsholt for three years before returning to the Hebrides. The location of Bǫðvarsholt is disputed, but its name suggests that Boðvarr *enn hvíti* might have taken over the farm after Þorsteinn left Iceland (S308n1).

The narrative descriptiveness of chapters S304-S308, their difference in content i.e. lack of family groups, and the individuals that they discuss compared to the proceeding chapters of Kolskeggr's section (S288, S291-S303), indicates that Sturla intervened at this point in the text.[82] The individuals that these land-claim narratives discuss—Boðvarr *enn hvíti*, Brand-Qnundr, Þorsteinn *trumbubein*, and Þórðr *skeggi*—have strong ties to the Sturlusynir and Bjǫrn *buna*. Therefore, it is probable that Sturla provided additional information and had pre-existing knowledge or more sources about the individuals and their relationships in this small area because they were his ancestors.

[82] Chapters S289-S290 cover Loðmundr *enn gamli*'s land-claim, which is an uncharacteristically detailed *landnám* for Kolskeggr's narrative unit.

4.5 Conclusion: A Social Network Analysis of Kolskeggr's Contribution in Sturlubók

Chapter IV shows that although Kolskeggr's contribution to *S* (S288-S335) is stylistically distinct, most individuals who are referenced in his section are integrated into the main subcomponent of the narrative network. This indicates that Kolskeggr, Sturla, and the other compilers of *Ldn* were working within the same conceptual framework. In this framework, pieces of information from different regions of Iceland would 'communicate' with each other over long periods of time. These figures of memory (people and places) would then be sequenced by the contemporary compiler to create a localised text to fit their present needs.

In Kolskeggr's section the characteristic terseness allows the audience to conjure their own mental images of their ancestors based on their personal knowledge. Conversely, more descriptive areas of the text lead the audience to think about a person or a place in a particular way based on the compiler's vision. This is demonstrated by Hrollaugr's lengthy land-claim narrative that is otherwise surrounded by brief accounts, which can be attributed to his connection to Sturla. Additionally, in areas of the text where narratives are more descriptive there tend to be more opportunities for relationships for people referenced in these chapters throughout the text. This is demonstrated by some notable kin groups being disconnected from the main subcomponent of the narrative network, which is not always attributed to them being 'invented', but rather there being a lack of internal information supplied about these groups. However, if there are several groups disconnected from the main subcomponent from the same area of Iceland, it may indicate that this region of the landscape was artificially 'filled' to produce a more cohesive narrative.

Yet, how do these individuals and kin groups come together and institute a social hierarchy in the *landnám* that is worth remembering and documenting in the thirteenth century? The next chapter, V, explores how *landnámsmenn* claimed land and interacted with other settlers in the earliest stages of Iceland's history, which led to certain families quickly consolidating power that they maintained for generations.

V Case Study: A Social Network Analysis of the *Landnámsmenn* of *Sturlubók*

Immigrants of various origins import their ideas and relationships to a new landscape, reconfiguring them to assimilate, alter, or establish a distinct society with its own social, political, and geographical features. Origin narratives from colonisation periods are constantly restructured to reflect a social group's contemporary perceptions and interests (Clunies Ross 1993). In this way, *landnámsmenn* during the *landnámsöld* not only acquired land and power through their familial, political, and geographical relationships, but they also colonised the collective memory of Icelanders through their social acts of claiming and naming the land. Even today, statues of *landnámsmenn* are scattered across the Icelandic landscape and the foundation figure of Ingólfr Arnarson looms over the city of Reykjavík.

To better understand how Sturla Þórðarson and his informants perceived their ancestors, this case study conducts SNA on individuals identified as *landnámsmenn* in *S*. This investigation provides a snapshot into how settlers and their land-claims were conceptualised and sequenced at a specific point in time. To explore how settlement and *landnámsmenn* are remembered in *S*, the following questions are asked:

- How do acts of land-claiming underpin hierarchical structures in *S*?
    - Do these textual patterns correspond to what is known about the geo-political organisation of 'real-world' medieval Iceland?
- Are *landnámsmenn* the most important people in *S*?
    - If so, then which in particular?
    - If not, who are the central figures in the narrative network and why are they important?
- If a settler has no social relationships and they are not connected to the main subcomponent of the narrative network is this evidence that they were created to 'fill' the landscape?

Examining these questions from an interdisciplinary approach allows socio-political patterns of settlement to emerge in network graphs. This process provides insight into how Sturla and other compilers used their shared past to inform their present.

5.1 Who is Considered a Landnámsmaðr?: Categories of Land-claiming in Sturlubók

In *S* there is 'no uniform land-claiming paradigm', and settlers acquire land in a variety of ways with each narrative imbued with its own political and economic significance (Long 2017b, 87). Since SNA does not work as well with this type of narratological ambiguity, clear categories are needed to establish who is a settler and how they acquire their land in *S* to conduct a case study on *landnámsmenn*. Using textual descriptions of settlement, eight categories of land claiming/acquisition have been created. If an individual acquires land using any of these eight methods, they are identified as a settler and sorted into the category of land-claiming that best fits how their land-claim narrative is described in *S.* Any form of categorisation inherently requires a level of subjectivity and cannot capture the geo-political nuance of every settler's land-claim; however, it does capture a broad overview of how individuals are acquiring land and the impact these actions have on their relationships in the network.

The eight types of land-claiming categories which are recorded in the 'attestation' and 'settler' sheets in the database are as follows (see 2.6.1.b, see below):[83]

1. Claiming land outright without the influence of another individual. These settlers are frequently presented with the formulaic prose of 'X settled Y', where Y is the area of land being settled and X is the name of a single settler who is linked to specific farms, boundaries, and geographic areas with phrases like *nam land* 'claimed land, literally

[83] See Sveinbjörn Rafnsson (1974, 128, 221-5) and Jakob Benediktsson (ÍF I cxxiv, pp. 441-525) for more discussion on land acquisition processes and lists of who they consider to be *landnámsmenn*.

took land' and *eignaðisk land* 'took possession of land' (Adolf Friðriksson and Orri Vésteinsson 2003, 145; ONP; e.g. S67, S338). It is also common for the settler X, to live at a farm named after them, X-*bær*/*-staðir* (Lethbridge 2016, 58-9). Individuals who were the first to live at a location identified by phrases like *bjó fyrst* 'lived first' and *byggði fyrst* 'settled first' are also included in the 'claim' designation (e.g. S20, S256).[84]

2. Settlers partake in a 'joint claim' when they claim land with one or more individuals. This process is denoted by the usage of the third person nom. pl. pronouns which depend on the gender composition of the group, *þeir* (masc.), *þau* (neut.), and *þær* (fem.) 'they'. For instance, the siblings Hildir, Hallgeirr and Ljót claim all the land between the Fljót and Rangá rivers as well as the whole of the Eyja district up to the Þverá, *Hildir ok Hallgeirr ok Ljót, systir þeira, váru kynjuð af Vestrlǫndum; þau fóru til Íslands ok námu land milli Fljóts ok Rangár, Eyjasveit alla upp til Þverár* (S349). Since the neut. pronoun *þau* is used in conjunction with these individuals land-claiming they are each categorised as being a part of a 'joint_claim'.
3. A person can achieve *landnámsmaðr* status by being gifted or granted part of another settler's land-claim—*gefa* 'to give' (e.g. S98).
4. An individual who buys land from another individual, often another settler, is considered a settler—*keypti land* 'buy land' (e.g. S357).
5. A settler who receives approval from another settler to make a claim—*at ráði* 'with the consent/approval of (e.g. S342).
6. The designation of 'multiple_actions' preserves the complexity of multi-step land-acquisitions which cannot be classified under one category. For example, Hróðgeirr and Oddgeirr are bought out of their original claim. This results in them moving and engaging in joint claim in another region of Iceland (S28, S374). Each of these instances could be placed under another category; however, to highlight they are settlers

[84] For how these formulas interface with the chronology of settlement see Barraclough (2012, 92). Arrival dates of settlers have not been considered for categorisation unless explicitly mentioned. The 'claim' designation includes all individuals associated with land boundaries and not just those who have farmsteads (Adolf Friðriksson and Orri Vésteinsson 2003, 149-51).

who have dealt with changes in land ownership, they are each assigned the 'multiple_actions' attribute.

7. Individuals who claimed land in Greenland as a part of Eiríkr *enn rauði*'s expedition but did not claim land in Iceland are given the 'Greenland_claim' designation (S89-S93).[85]
8. The category 'other' is applied to atypical land-claim narratives which occur too infrequently to be given their own category. The types of land-claims which fall into this category include but are not limited to:
    a. Land acquired through a challenge *holmganga* (e.g. S326, S389).
    b. Land-claimed on behalf of another settler (*e.g.* S184, S247).
    c. Receives land via a dowry—*fylgja heiman* 'be contributed as dowry (for the bride)' (e.g. S282).
    d. Received advice on where to settle from another settler (e.g. S125).
    e. Took possession of land in another's claim without the original settler's knowledge or approval (e.g. S25).

If an individual is identified as a *landnámsmaðr* based on the above criteria, they are assigned a 'yes' value in the 'landnámsmenn' column in the 'attestation' sheet in the database (see 2.6.1.b). [86] 425 individuals (13.66%) have been identified as *landnámsmenn* in *S.* This number falls within the expected range of 400-430 settlers often given in scholarship (ÍF I ccxxiv; Jakob Benediktsson 1966-9, 275; Sveinbjörn Rafnsson 1974, 221-5; Smith 1995, 320; Egeler 2016, 275; Jesch 2022, 114).[87] People who do not meet the qualifications to be a settler are given a value of 'no' and considered non-settlers (2,687 people, 86.34%). This group comprised of descendants of settlers, people who visit but do not settle in Iceland, people who come to Iceland with a settler as a part of their household but do not claim land on their own accord, and individuals remaining in the homelands.

[85] Eiríkr is an exception and falls under the 'multiple actions' category (S89, S92, see 5.3.1.c.ii).
[86] 'Landnámsmenn' is used as the title of the column because *-menn* includes people of both genders and being a settler is not a gender specific category.
[87] Some of these counts conflate settlers across all three medieval redactions, here only settlers in *S* are counted.

Additional information regarding *landnámsmenn* and how they claimed land is recorded in the 'settlers' spreadsheet of the database. This sheet contains the following data:

- 'unique_id' of settler
- Their 'standard_name'
- The chapter(s) of their land-claim
- The Quarter where their land-claim is located
- Their gender
- How they acquired land—one of the above eight categories is input
- The ON-I description of claim
- If they are a primary, secondary, or dependant settler (see 5.3.1.)
- If given land, who gave them the land
- If they bought land, who was the seller
- If they overwintered before permanently settling
- If they settled in Ingólfr's claim
- If they settled in Skalla-Grímr's claim
- If they claimed land with a family member
- If they emigrated to Iceland with another settler

Most of this information is not used to conduct case studies on *landnámsmenn*, but it is useful for analysing and contextualising results from SNA.

5.2 Visual Analysis of the Landnámsmenn in Sturlubók's Narrative Network

Figure 48 is a visualisation showing where settlers are in the main narrative network subcomponent. The enlarged red nodes represent the locations of *landnámsmenn* in the graph and the grey nodes symbolize non-settlers. The nodes of *landnámsmenn* are evenly distributed across the visualisation, appear in areas of high clustering/connectivity, are rarely located on the network's periphery, and only a small number are entirely disconnected from the main subcomponent (see 5.6). This organisation highlights the perceived importance of *landnámsmenn* in the network compared to non-settlers.

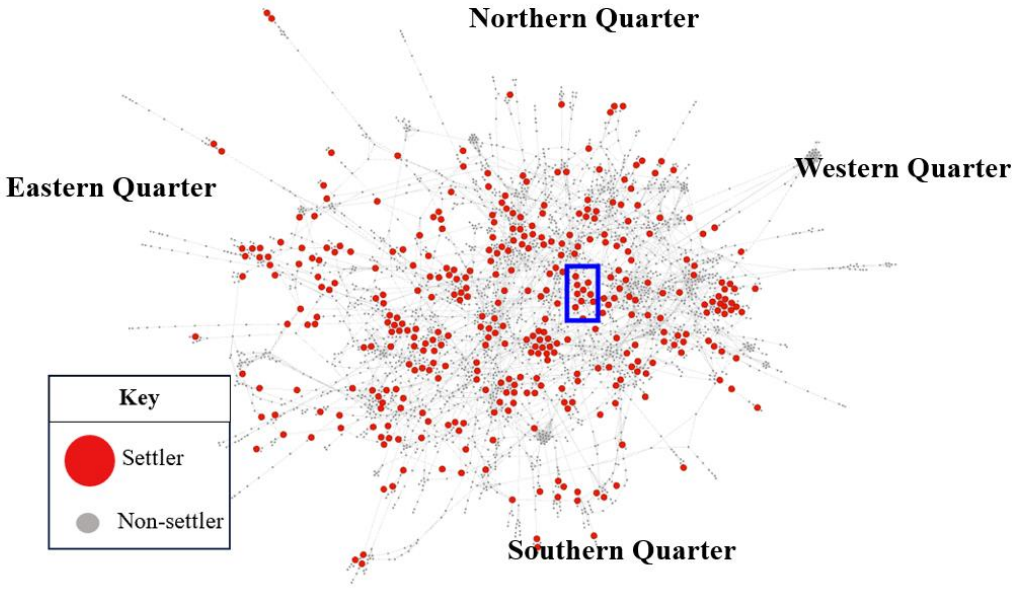


Figure 48 Location of landnámsmenn in main narrative network sub-component

The privileged positioning of settlers can also be seen in Figure 49. In this graph the nodes of settlers are enlarged and in red, and non-settlers' nodes are coloured by their narrative unit (see 3.4). Many red nodes are at the heart of the graph indicating that they are important across the entire network. Other red nodes are found in areas where two clusters of different colours meet indicating that these setters function as intermediaries between Quarters, facilitating relationships between individuals in different geographical regions. But perhaps, the most striking pattern emerging from these visualisations regarding the establishment of a hierarchical system in medieval Icelandic society is that most *landnámsmaðr* have a relationship with at least one other settler and are often part of a cluster of *landnámsmenn.*

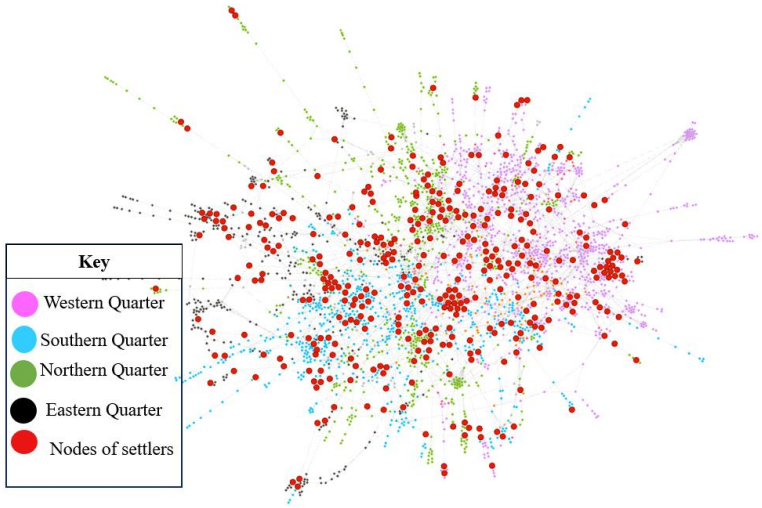


Figure 49 Nodes of settlers overlaid on network partitioned by narrative units of appearance

5.2.1 Establishing a Hierarchy in the *Landnám*: Relationships between Settlers

To analyse why settlers cluster together in the narrative network, a group of *landnámsmenn* have been randomly selected to assess potential factors contributing to this phenomenon. The chosen area is identified by the box in Figure 48 and is magnified in Figure 50. The individuals (red nodes) who comprise this cluster are: Helgi *bjóla*, Ørlygr *enn gamli*, Kollr, Þórólfr *spǫrr*, Þorbjǫrn *skuma*, and Þorbjǫrn *tálkni*.[88] This group makes for an interesting micro-case study because their pre-settlement relationships immediately change once they arrive in Iceland to adapt to their contemporary circumstances. Additionally, Helgi *bjóla* and Ørlygr *enn gamli* are part of Bjǫrn *buna*'s lineage (see 5.4 and 5.5.3.b.ii for discussion).

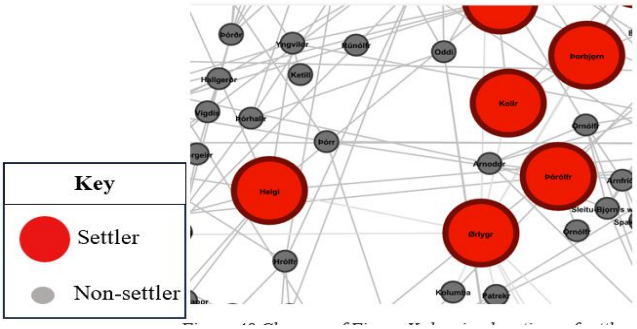


Figure 50 Cluster of the settlers Helgi bjóla, Ørlygr enn gamli, Kollr, Þórólfr spǫrr, Þorbjǫrn skuma, and Þorbjǫrn tálkni enlarged from blue box in Figure 46

[88] Þorbjǫrn *tálkni*'s node is the uppermost red node that is on the edge of the image.

5.2.1.a Preexisting relationships: connections between landnámsmenn before settling in Iceland

Ørlygr *enn gamli* travelled to Iceland with his foster-brother/blood-brother Kollr, Þorólfr *spǫrr*, and the brothers Þorbjǫrn *skuma* and Þorbjǫrn *tálkni* (S15). Considering that there are two sets of brothers—one consanguineous, the other fictive—this joint migration can be considered a premeditated act. These relationships not only establish that these individuals had some form of connection prior to their arrival in Iceland, but also provide context as to why they travelled together. Even in cases where the exact relationships between individuals travelling to Iceland together are unknown, there seemingly had to be some connection—whether it be direct or through an intermediary—in the homelands to board the same ship. Even though there is no indication of how Ørlygr and both Þorbjǫrns knew each other prior to migration, it can be assumed they would have interacted at the port or on the ship before reaching Iceland.

Such joint migrations are not unusual in *S* and approximately 21.18% of *landnámsmenn* migrate to Iceland with another settler. This percentage does not factor in non-settlers who travelled to Iceland with a *landnámsmaðr.* Therefore, presumably even more people would have migrated with Ørlygr, Kollr, Þorólfr, Þorbjǫrn *tálkni*, and Þorbjǫrn *skuma* to make the journey economically viable.

The limited confines of a boat would amplify interactions between individuals, creating new relationships which could be inserted into the collection of origin narratives. Thus, ships functioned as transient social spaces, physically distinct from the travellers' points of origin and their destinations. However, since these migrations stories are not rooted on land, but attached to the act of movement, they can be used to embellish a settler's background before they set foot on the island. For instance, when lost at sea, Ørlygr makes a vow to Patrekr *enn helgi*, the bishop of the Hebrides and his fosterer, that he would name wherever they landed after him. This proclamation highlights Ørlygr's piousness and North Sea connections in the view of the audience. Perhaps a more prominent example of creating

descriptive narrative space on boats is when one person throws their high seat pillars overboard and a fellow traveller question their beliefs e.g. Helgi and his son, Hrólfr (S218; see Wellendorf 2010). Once a settler arrives on land it becomes more difficult to manipulate and create narratives around a settler because they are now bounded by the physical landscape, whereas the vastness of the sea provides ample space for adding information.

5.2.1.b Staying together: overwintering in the landnám

For many settlers their first action in Iceland is not land-claiming or establishing a permanent residence. Instead, they either set up a temporary residence or overwinter at another individual's farm—who is more likely than not also a *landnámsmaðr*.[89] These overwintering relationships demonstrate that information was travelling between the homelands and Iceland and vice versa (Jesch 2015, 195-6).

After coming to Iceland, Ørlygr overwintered with his cousin, Helgi *bjóla*. This kinship relationship likely facilitated Ørlygr's arrival and settlement because Ørlygr appears to know the directions to get to Helgi's farm and Helgi probably had more of an obligation to host his kin. However, there is no indication that Ørlygr's travel companions Þorólfr *spǫrr*, Þorbjǫrn *skuma*, Þorbjǫrn *tálkni*, and Kollr also overwintered with Helgi. This could be because they were not direct kinsman of Helgi, therefore, Helgi might have felt he had no strong obligation to house them. Alternatively, Helgi might not have had enough resources or was too miserly to host them all. Either alternative is possible considering Helgi only offered housing for half of his sister's, Auðr *djúpauðga,* retinue (S97).

Relationships formed via overwintering and temporary settlement can only be briefly discussed at present, but SNA has identified that these relationships require more analysis. The focus in *landnám* scholarship has been on permanent boundaries and residences and interim locations of settlers are

[89] For examples of a would-be settler overwintering—often during their *fyrst vetr* 'first winter' in Iceland—with another individual—usually another *landnámsmaðr*—before permanently settling see S14, S15, S35, S36, S86, S97, S146, S149, S152, S155, S179, S197, S348, S379, S385, S389, S394. For overwintering in other contexts see S89, S217, S284.

only mentioned in passing. Even the most famous example of this type of transient movement involving Ingólfr's settlement where he first wintered on the southeastern coast of Iceland, now called Ingólfshǫfði, before moving to Hjǫrleifshǫfði, then Ingólfsfell, and finally settling at Reykjavík has not been fully explored. Here it is clear that his influence is imprinted onto the landscape via place-names and his attachment to this location has been briefly mentioned (Barraclough 2012, 92). However, more questions can be investigated, for instance:

- Why do temporary locations receive his name and not his final settlement?
- Does his journey follow a realistic path in the landscape?
- What were the relationships he established at each location?

Ultimately, re-examining relationships of overwintering can establish a better chronology of settlement because the individual hosting a newcomer presumably would have made it to Iceland first.

5.2.1.c Parting ways or retaining bonds?: relationships between landnámsmenn after settlement

After spending the winter together, Helgi grants Ørlygr approval to settle within his land-claim. This act triggers a change in status between the cousins. By accepting Helgi's offer, Ørlygr becomes his dependant because he is bound by obligation to return this favour either at the same level of value or more. This was likely a strategic move by Helgi because installing a neighbour who has vested interest in protecting the area, their kinship, and maintaining honour creates a powerful ally. The farms of Helgi (Hof) and Ørlygr (Esjuberg) are shown on Figure 51 in blue.

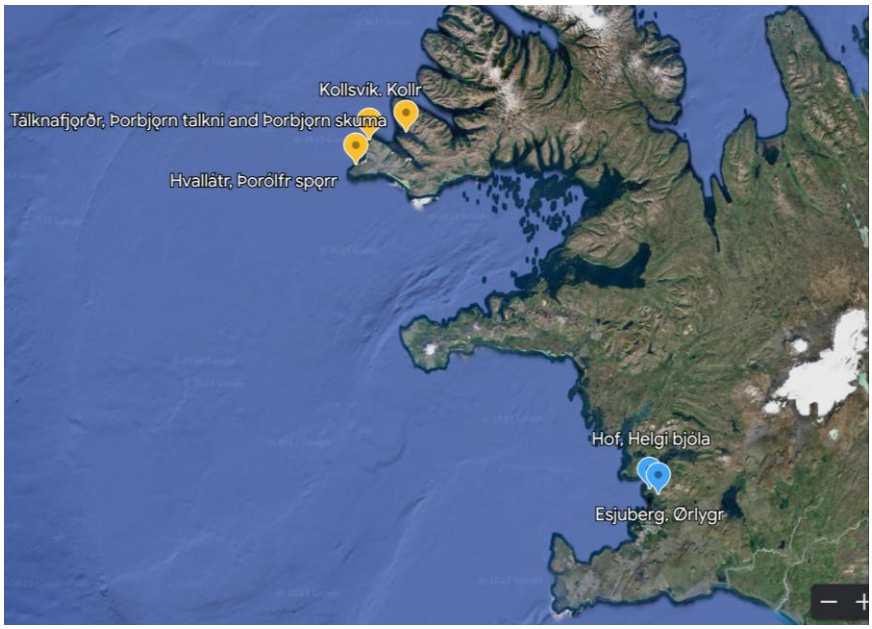


Figure 51 Locations of landnámsmenn in Figure 50

Ørlygr's shipmates Þorólfr *spǫrr*, Þorbjǫrn *skuma*, Þorbjǫrn *tálkni*, and Kollr all settle far away from him. All their farms, represented in yellow in Figure 51, are located further up the coast in the West Fjords. There is a lot of narrative and physical space between Ørlygr's *landnám* and his former comrades (S131-S133). Of particular interest is Ørlygr's blood/foster-brother Kollr, who settles near Þorólfr *spǫrr*, Þorbjǫrn *skuma*, and Þorbjǫrn *tálkni* instead of Ørlygr. This could indicate that consanguineous kinship bonds were more valuable than fictive kinship ties once in Iceland. This is supported by the brothers Þorbjǫrn *skuma* and Þorbjǫrn *tálkni* claiming land together, *þeir námu*, thereby reinforcing their pre-existing consanguineous bond. Alternatively, Kollr could have developed a strong relationship with these men via travel or have an unknown pre-existing relationship with them that made him want to settle in the same area as them. Thus, Kollr's *landnám* narrative demonstrates how personal relationships change in a settlement context.

This perceived change in their relationships is mirrored in network graphs. *Landnámsmenn* who have pre-existing relationships before they settle in Iceland tend to appear near each other in network graphs. This suggests that conceptually they are linked in the historical record even as over time their family's relationships become more distant as they interact with different kin groups over time and their locations in the network become more dependent on

geography (see 3.4.1 and 3.4.2). Although many of Ørlygr's shipmates did not have kin mentioned in *S* it is likely that their kin groups grew apart over time because they are in different areas of the Western Quarter. On the other hand, Ørlygr's and Helgi's families interact within the same social circles because they live near each other.

5.3 How are Landnámsmenn Claiming Land and Why is it Important?

Partitioning the network by settlers and non-settlers shows that *landnámsmenn* appear near other settlers and are usually found in highly connected areas in the network graph. However, these visualisations only present a superficial view of socio-political power dynamics in *S* because settlers are expected to have more social capital than non-settlers.

A better question to investigate from a social network-theoretical perspective is how settlers are claiming land in *S* and how they acts impact their perceived social status? As demonstrated by Helgi *bjóla* giving approval to Ørlygr to settle within his claim, each type of land-claiming mechanism: claiming outright, gifting land, etc., carries its own social connotations. These land acquisition methods also contribute to unequal power dynamics not only between settlers and non-settlers, but also the *landnámsmenn* themselves. Therefore, better understanding land interactions between *landnámsmenn* sheds light onto how different forms land-claiming underpin hierarchical structures in *S*.

Figure 52 displays the frequency in which a particular method was used to claim/acquire land by the 425 *landnámsmenn* (see 5.1). The height of the blue bar in Figure 52 shows that by a large margin, settlers in *S* independently claim their land. This statistic is unsurprising because this method creates a strong cognitive link between land and settler. The social acts of claiming and naming land 'establish and legitimise a connection or a direct relationship with the land, not least, one that implies or communicates ownership and thus power' (Wyatt 2004, 55–72; Lethbridge 2016, 83). In this way, *landnám*

narratives enable the *landnámsmaðr* (and by extension their descendants) to not only physically 'occupy' the landscape but also be cognitively attached to the topography in the collective consciousness of medieval Icelanders (Barraclough 2012, 92-7).

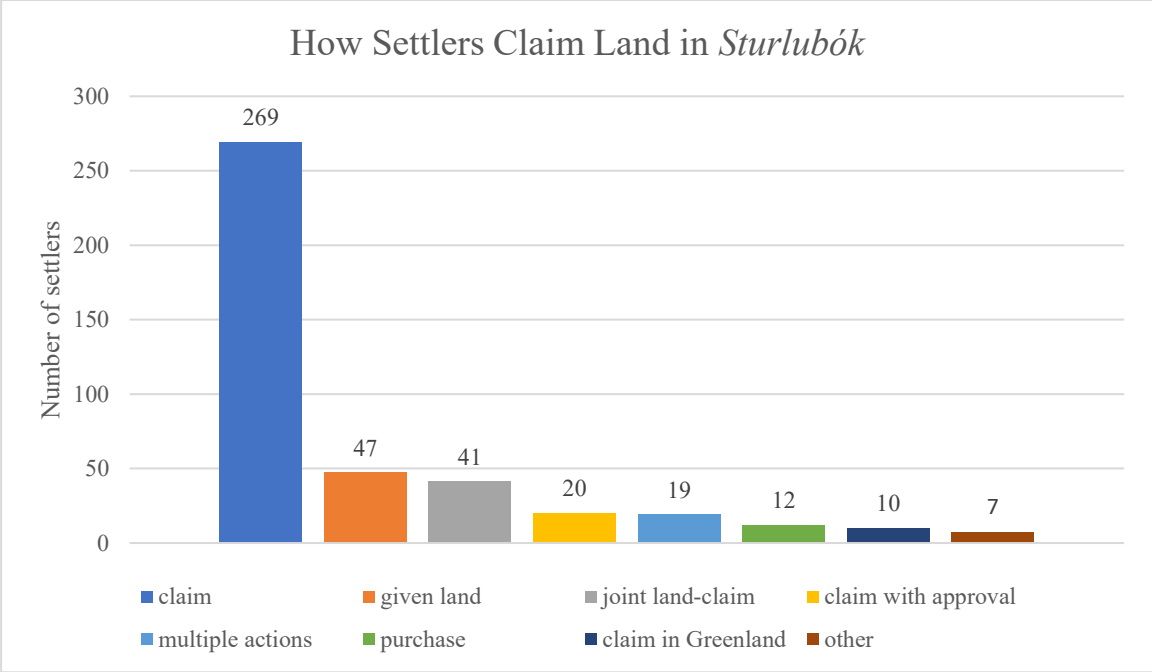


Figure 52 How settlers claim their land according to Sturlubók

Joint-land claims, the third most common land-acquisition method, function in a similar manner to independent land-claims. The main difference is that since there are two or more *landnámsmenn* associated with the *landnám*, there is presumably a larger pool of descendants who can cognitively attach themselves to the claim. Overall, 72.94% of *landnámsmenn* acquire their land through the direct actions of independent or joint land-claiming.

The second-most common way of becoming a settler is being gifted land, 11.06%. This action is inherently relational establishing an unequal connection between giver and recipient of land.

All other land-acquisition instances—claim with approval, multiple actions, purchasing, claiming in Greenland, other—combine to only represent 16% of total *landnám* narratives. If *S* preserves how people settled, or at least retains the memory of who is associated with the land, recording these uncommon land-acquisition methods could be used as narrative devices to

emphasise an individual's or families' ownership of claim. For example, there are only twelve instances in *S* where an individual purchases their land-claim. Documenting a purchase relinquishes any claims of ownership by the seller and the new occupant has no further social obligation to continue their relationship. For instance, *Þorgeirr keypti Oddalǫnd at Hrafni Hængssyni ok Strandir báðar ok Vatnadal ok allt milli Rangár ok Hróarslækjar; hann bjó fyrst í Odda* 'Þorgeirr purchased Oddaland from Hrafn son of *Hængr* [Ketill *hængr*] as well as both Strands and Vatnadalr and everything between the Rangá and Hróarslækr; he was the first to live at Oddi' (S357). This purchase not only allows the buyer's (Þorgeirr) descendants to be linked to the land, but also prevents the seller's (Hrafn) progeny to stake a claim. Furthermore, this transaction shows that Oddi is perceived as a very important farm (and estate) because its acquisition by purchase separates it from neighbouring farms, which were obtained by more conventional methods e.g. land-claim.

These past land transactions could also have contemporary consequences. In this case, the Oddaverjar family were based at Oddi in the thirteenth century, therefore, with this purchase they prove historical ownership of the land via their ancestor, Þorgeirr. Therefore, other relationships in the 'other' category' like dowries and challenges for land (*hólmganga*) could also serve a similar function in terms of being extraordinary land-transferals that establish a new owner of a claim. Analysing these uncommon land-transactions on a case-by-case basis would provide more insight into what types of farms were being purchased/fought over/given in a dowry as well as who were the players in these transactions. However, the micro-analysis of these land-claims is outside the scope of the present thesis, which focuses on broader land acquisition patterns.

Analysing individual land-claims only provides context for the physical acts of claiming and settling the land, but it does not fully capture the socio-political dynamics and impact these actions have on the relationships between all the settlers and how they influence a *landnámsmaðr*'s social standing in the wider community. Therefore, settlers have been further categorised as either

primary, secondary, or dependent settlers based on how they claimed land so see how these contribute to the construction of a hierarchy in *S*.

5.3.1 A Hierarchy of Settlers: Primary, Secondary, and Dependant Landnámsmenn

To explore how a select group of individuals end up controlling the flow of information and power in the network of *S*, this thesis investigates the physical actions used by settlers to claim land and how these methods contribute to a hierarchy of primary, secondary, and dependant settlers. Of course, the social standing of a settler is also impacted by their legal status, when they arrive, who they are related to, the size of their land-claim, etc. (see Callow 2020, 159). At present these elements have not been subjected to SNA approach, therefore, they are only discussed in relation to the how settlers interact with each other via land-claim processes.

5.3.1.a Defining primary, secondary, and dependent settlers

Individuals are labelled as 'primary' settlers when they claim land outright without outside influence of other individuals. Settlers who fall into the 'claim' and 'joint_claim' categories are considered primary settlers (see 5.1 number 2). Settlers involved in 'joint_claims' are primary settlers because they actively choose to engage in a partnership with another individual—often a relative—and still acquire land without the involvement of anyone besides their chosen partner (see 5.1 number 2). The label 'Greenland_primary' is attached to settlers who claimed in Greenland, but not in Iceland (see 5.1 number 7).

'Secondary' settlers are individuals who acquire their land-claim from another person likely another *landnámsmaðr*, but after the transaction there are no further social obligations between the individuals. For example, Steinunn made a point to purchase her land-claim with a spotted coat from Ingólfr instead of receiving the land as a gift (S394). By purchasing the land immediately, she absolves herself of future social obligations. If she accepted the land as a gift, she would have been indebted to Ingólfr and must repay him with a gift of equal value at another point in time. Therefore, individuals who

purchase their land, *keypti land*, are categorised as secondary settlers (see 5.1 number 4). Other individuals in the 'multiple actions' and 'other categories' are assigned this classification on a case-by-case basis (5.1 numbers 6 and 8).

'Dependant' settlers acquire their land from another individual. This distinction includes settlers claiming land with the approval (*at ráði*) of another individual/settler (see 5.1 number 5). This act subjugates the settler receiving approval to the one granting it, but still allows for a positive connection (Callow 2020, 193). Nevertheless, a 'lesser category of colonist' is established through this process. Settlers who are granted or given land are also considered dependant settlers (see 5.1 number 3). The act of giving land creates 'greater initial power differential' between the original claimant and the recipient which may dissipate over time (Callow 2020, 200). In addition, being the recipient of land could be interpreted as a cowardly act (S389; Miller 1986a, 32n59; 1986b, 40). Only a gift commensurate to the gifted land could be extinguish this obligation (Miller 1986b, 39-40). The preservation of these land-transfers demonstrates the need to preserve or manipulate the text to show that there was a hierarchy amongst the earliest inhabitants of Iceland even if descendants of those given land eventually achieved full autonomy from the land-givers. That is why those given land are identified as dependent settlers. The dependant settler label can also be applied to *landnámsmenn* who have claimed land through 'multiple actions' depending on how they came about their land.

The final category in the hierarchy is 'multiple_category' settlers. These individuals often claim their land through 'multiple_actions' or have several claims which each feature a different way to claim land. For instance, in one land-claim chapter, Þórðr *skeggi* receives approval to claim land and in another *landnám* narrative he claims his land outright (S11, S307). Since receiving approval is considered a dependant and the act of claiming is associated with primary settlers, he is considered a multiple category settler.

Figure 53 shows the breakdown of primary, secondary, dependant, primary Greenland settlers, and multiple category settlers in *S.* It is unsurprising that most settlers fall into the primary grouping because claiming land independently is the most common land acquisition method. What is

interesting is the lack of secondary settlers compared to dependent settlers on the chart. This pattern implies that individuals who were able to part with a piece of their land preferred to do so through gifting/granting land instead of selling it. Selling land suggests that there are two equal actors involved in a transaction because there is an established price set by the seller which the buyer is willing to purchase the land. There is no need for a prolonged interaction after the purchase because the social parameters of the transaction have been laid out and completed. Alternatively, gifting land establishes imbalanced social obligations subjugating receivers to the givers. This gift may be perceived as altruistic, imbuing the giver with social capital, but ulterior motives may hide behind the seemingly generous act. Donated lands could be given with the grantor knowing that the receiver might not be able to recompensate them, in turn socially indebting the giftee to the giver. Based on actual landscape patterns, gifted lands were also smaller in size or not as suitable for agriculture/animal husbandry to avoid strong opposition from rising from within one's land-claim (Orri Vésteinsson 2001, esp. 20-3). *S* generally follows the same pattern with settlers who claim large swathes of land like Skalla-Grímr usually giving away not as desirable patches of land to their subordinates (see 5.3.1.c.iii). Thus, granting land/giving approval to settle is where hierarchical structures begin to form in Iceland.

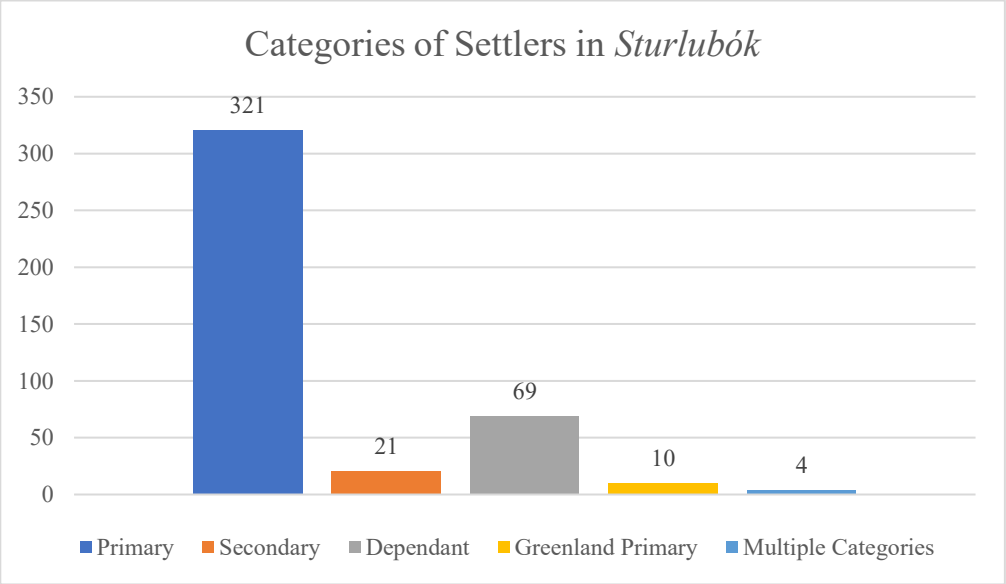


Figure 53 Numbers of Primary, Secondary, and Dependant Settlers

5.3.1.b Patterns of dependency: an emerging social hierarchy in Sturlubók

Patterns of dependency can be further investigated using network graphs to see how settlers interact with other settlers both of their own group (primary, secondary, dependent) and with those in another category. Figure 54 is a visualisation showing the 425 *landnámsmenn* recorded in *S*, with all nodes of non-settlers removed. The node of each settler corresponds to their assigned social status.

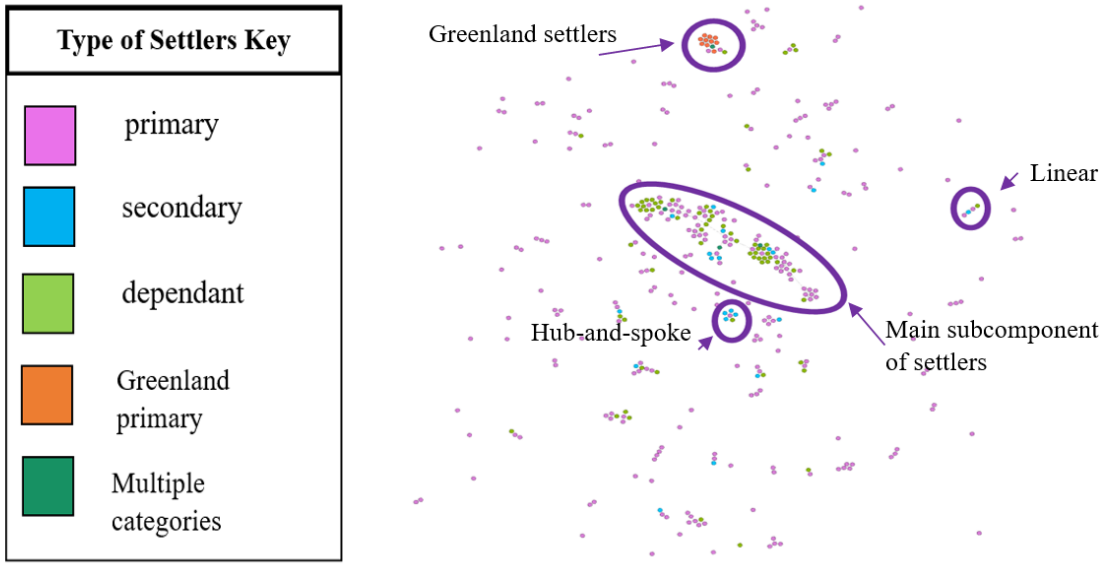


Figure 54 Network graph of primary, secondary, and dependant settlers

The overarching pattern in Figure 54 is that *landnámsmenn* appear in the network connected to another settler or within a group of settlers. It is rare for a settler to visualise as an independent node and have no connections with other settlers. This suggests that settlers desire relationships with other settlers in the network and actively seek to create groups together.

Settlers' nodes tend to appear as dyads—two individuals linked together—and in linear formations such as the string of individuals identified by the 'liner' label in Figure 54. Other settlers appear on the graph in hub-and-spoke models, indicated by the 'hub-and-spoke' and 'Greenland settlers' labels. In these formations, the node of a primary settler is in the middle and the nodes of secondary and/or dependant settlers radiating out from the central figure,

presenting clear visual evidence for a hierarchy amongst a group of settlers (see 5.3.1.c.ii).

The most striking feature of Figure 54 is the large central subcomponent of interconnected hub-and-spoke models that is circled by the large, purple oval. In this arrangement, which will be discussed in more detail in 5.3.1.c.iii, there are many primary settlers surrounded by secondary and dependant *landnámsmenn*. This formation indicates that a nascent hierarchy emerges amongst settlers. But how does this hierarchy influence the overarching narrative and network structures of *S* and how does it change the understanding of the context in which *S* was compiled?

Instituting an internal hierarchy is considered the first step in establishing domestic sovereignty, that is 'the formal organization of political authority within the state [here medieval Iceland] and the ability of public authorities to exercise effective control within borders of their own polity' (Krasner 1999, 3-4). In other words, hierarchy is synonymous with self-governance. The *landnám* is an effective framework for the distributed network of social memory contributors—which includes *Ldn* compilers—to construct a social pyramid because boundaries and ownership are natural features of settlement (see 1.3.2.a).

For the first generation of Icelanders these borders are flexible, and an individual's status as a *landnámsmaðr* can be negotiated via buying, receiving, or taking land. These actions not only conceptually link individuals to their land, but they also create a historical association between the settlers engaged in the land transaction/donation. This mutual attachment confirms both of their statuses as *landnámsmenn* because it is recognised by another individual—both the compiler and character in *S*. Additionally, documenting the land-acquisition method between settlers also preserves each of their roles (giver of land, buyer, recipient etc.) at a particular point of time and the perceived social connotations and obligations each position carries. In this way, a power differential between main settlers in the region and secondary and dependent settlers is committed to memory.

The uncertainty of settlement creates a malleable narrative space where these land relationships can also be embellished, reimagined, or deleted to create desired connections in contemporary times. A person can even be constructed to fill the landscape (see 5.6). However, all individuals and relationships recorded in *S* still need to be socially recognised and have a feeling of veracity—even if they are not entirely historically 'accurate'—so that they can be accepted and fit into a collective abstract framework of settlement that has evolved from the *landnám* to the thirteenth century. In other words, *S* is a genealogical charter or living document at work reflecting contemporary societal needs (see 1.3.2.a).

In the period in which *Ldn—S* particularly—was compiled, the geo-political situation in medieval Iceland would have been formalised, if not fully institutionalised with well-defined social and political roles. *S* captures the transition of Iceland from a nascent settlement society to a land governed by law by sprinkling allusions to changes in political structure throughout the text. This process begins immediately with Úlfljótr credited in two chapters as bringing law to Iceland, *er lǫg hafði út* (S231, S307; Jakob Benediktsson 1974, 170-1).[90] Þorsteinn, the son of Ingólfr Arnason, is mentioned as the founder of the Kjalarnesþingi, which was instituted before the Alþingi, *Þorsteinn, er þing lét setja á Kjalarnesi, áðr alþingi var sett* (S9). This information is asynchronous with the actions taking place in the settlement period because it mentions the Alþingi (c.930) whose institution marks the end of the *landnám*; however, the correct chronology of institutions is carefully preserved by Sturla. These references highlight that by the second generation of Icelanders local judicial and legislative frameworks were constructed so that a countrywide government could be built. This is further emphasised in genealogies where descendants of settlers are recorded with the titles of *goði* '(political and clerical) chieftain (of the Icelandic Commonwealth), leader' and *lǫgsǫgumaðr* 'lawspeaker' marking that they have inherited the qualities of overseeing a

[90] Úlfljótr does not have his own land-claim chapter, therefore, he is not considered a settler. It is likely that he was in the first or second generation to arrive in Iceland based on contextual information.

domain from their *landnámsmenn* ancestors (see 3.6.2).[91] These institutions and roles though closer to the period of compilation than settlement are not treated as incongruencies from the settlement period, but rather as natural evolutions from it.

This political evolution is evident in the organisation of the text which is arranged based on the geo-administrative unit of Quarters which are anachronistic to the settlement period (see 3.2). However, these textual boundaries are not perceived by Sturla as separate from the settlement period with phrases like *en þessir landnámsmenn hafa gǫfgastir verit í Sunnlendingafjórðungi* 'and these were the most outstanding settlers of the Southern Quarter', but as a progression from this time (S397). The most prominent example of this political transition from settlement to the Commonwealth and beyond is the insertion of S398 which documents the greatest chieftains after the settlement period, *þá lifðu enn margir landnámsmenn ok synir þeira. Þá er landit hafði sex tigu vetra byggt verit, váru þessir hǫfðingjar mestir á landinu* '[at the end of this period] a good many of the settlers and their sons were still living. After the land had been settled for sixty years these were the greatest chieftains in Iceland…'. This statement/chapter marks not only the end of the text—along with the Christian settler chapter, but also the inheritance of power from prominent settlers to their children and descendants. This is further demonstrated by the seven father-son relationships and two group names, the Guðdœlir and the Hjaltasynir, in S398. In the last line of the chapter, Hrafn, son of the settler Ketill *hængr*, is mentioned as the lawspeaker at the time (c.930-949), *hafði þá lǫgsǫgu*, indicating that there is almost no perceived chronological gap between settlement and the formation of a sovereign political entity.

[91] Based on the occupational bynames *goði*, *aurgoði*, or regional variants like *Hlíðmannagoði*, twenty-eight *goðar* have been identified in *S* (S4, S9, S32, S37-S38, S42, S46, S69-S70, S75, S79, S81, S84-S86, S100, S105, S108-S109, S111, S119, S123-S124, S138, S140, S177, S185, S187, S211, S213, S228, S234, S237, S242, S244, S247, S258, S266, S283-S284, S325, S335, S338, S344, S346, S355, S361, S379, S386, S392, S398).Twelve *lǫgsǫgumenn* are mentioned (S35, S88, S109, S129, S255, S282, S320, S334, S365, S379).

5.3.1.c. Group level dynamics of primary, secondary and dependent settlers

To demonstrate how hierarchal structures are constructed amongst settlers at the group and individual level in the narrative network of *S*, micro-case studies examining the different relationship formations—linear, hub-and-spoke, and the main subcomponent—have been conducted. All these formations are circled in purple in Figure 54.

5.3.1.c.i Linear patterns

In linear patterns like Figure 55 settlers are linked to each other through mutual acquaintances. Usually, all settlers comprising a linear formation live within the same locality. For instance, Ásgeirr *kneif*'s original claim extended between the Seljalandsá and Lambafellsá in the Southern Quarter, which are represented by the orange and yellow markers in Figure 56—the exact location of Ásgeirr's farm is unknown (S339). Ásgeirr sold some of his land between the Írá and Seljalandsá to Þorgeirr *enn hǫrzki* who then farmed at Holt, yellow marker in Figure 56 (S340).

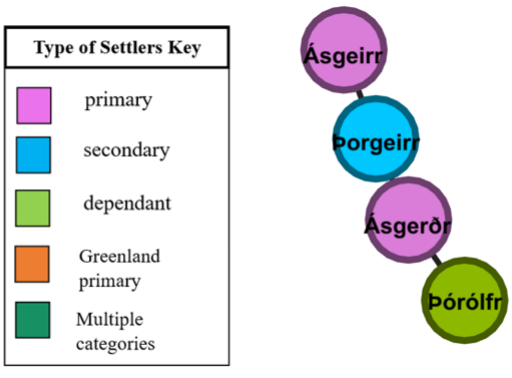


Figure 55 Settlers' nodes in a linear formation

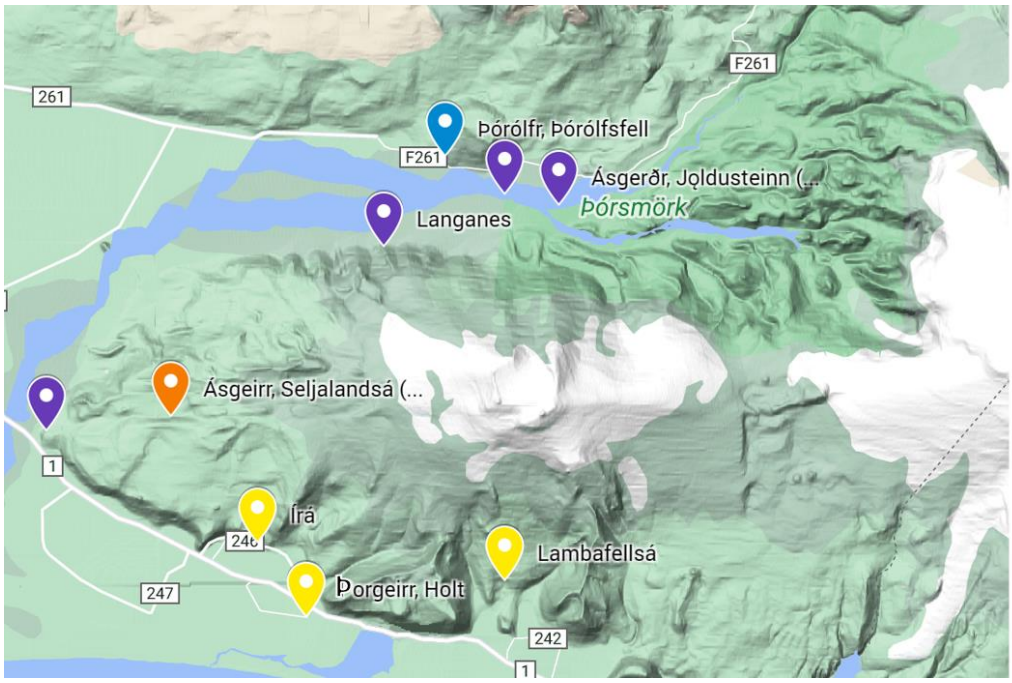


Figure 56 Map of locations associated with settlers in Figure 55

Ásgerðr, another primary settler in the region claimed land between Seljalandsmúla and Markarfljót and Langanes up until Jǫldusteinn and lived north of Katanes, locations are purple in Figure 56. She gave her illegitimate brother, Þórólfr—who also came to Iceland with her—approval to settle west of the Markarfljót and establish a farm at Þórólfsfell, blue marker in Figure 56 (S341-S342). These settlers form an area of control around the Markarfljót, but there is also a hierarchy amongst these settlers.

Ásgeirr and Ásgerðr are of similar status because they both claim their land outright. Þorgeirr *enn hǫrzki* presumably comes to Iceland after Ásgeirr and must purchase land from him, but this transaction has no further social obligations other than living nearby each other. Þórólfr is reliant on his half-sister Ásgerðr to receive land which might be a consequence of his illegitimacy. However, the social dynamics in the region change because Þorgeirr and Ásgerðr eventually marry.

This union geographically squeezes Ásgeirr's land-claim. On one side of Ásgeirr's land is Ásgerðr's claim, which is eventually inherited by one of her sons from her previous marriage. On the other side of Ásgeirr's claim, is Þorgeirr's farm Holt which is presumably passed down to one of his children,

probably Holta-Þórir. In this case, being surrounded by these farms does not appear to impact Ásgeirr's descendants because one of his progenies, Jón Ögmundsson, became the first bishop of Hólar. Nevertheless, this example demonstrates how authority and power can be locally constructed via interrelationships between settlers of relatively equal social statuses. Each linear pattern needs to be studied in its own right to see what local dynamics can be uncovered, but the first step of identifying groupings of interest has been achieved through SNA.

5.3.1.c.ii Hub-and-spoke model

In hub-and-spoke formations there is a central settler with edges radiating out towards other nodes who are influenced by or dependant on the prominent *landnámsmaðr*. In Figure 57 the central settler is Hrollaugr, the son of Norwegian jarl, Rǫgnvaldr *á Mœri*. His central position reflects his regional importance (see 4.3.2).

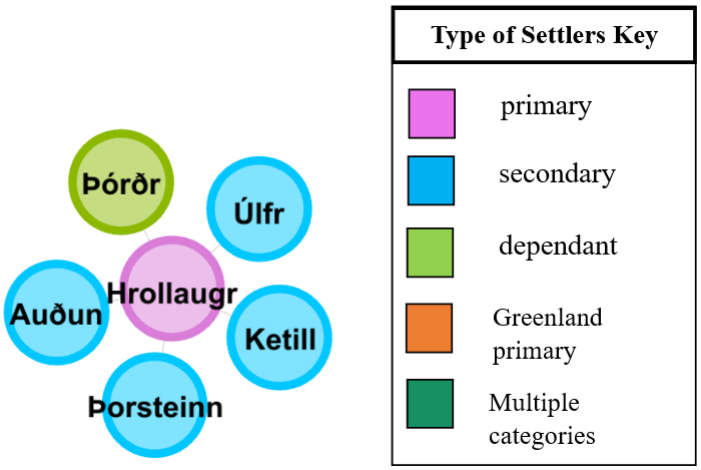


Figure 57 Hub-and-spoke model with Hrollaugr as hub

Hrollaugr is considered the leading settler of south-eastern Iceland and is the progenitor of the *Síðumenn*, who were amongst the earliest Christians in the tenth century (see also 4.2.2 and 4.3.2). After receiving approval from King Haraldr to go to Iceland, he brought his ship into Hornafjǫrðr in the east and threw his high-seat pillars overboard (S310). Although his high-seat pillars washed ashore in the same fjord that he cast them from, his ship drifted to

along the coast to the west of Iceland. He and his family spent their first winter in Iceland at Leiruvági á Nesjum and the next at Ingólfsfell before making their way back to the east. He established his first farm at Skarðsbrekka in Hornafjǫrðr before moving to Breiðabólsstaðir (pink marker in Figure 58). He sold all his land north of Borgarhǫfn (orange marker on Figure 58), but kept all the land south of Heggsgeriðismúla, location unknown.

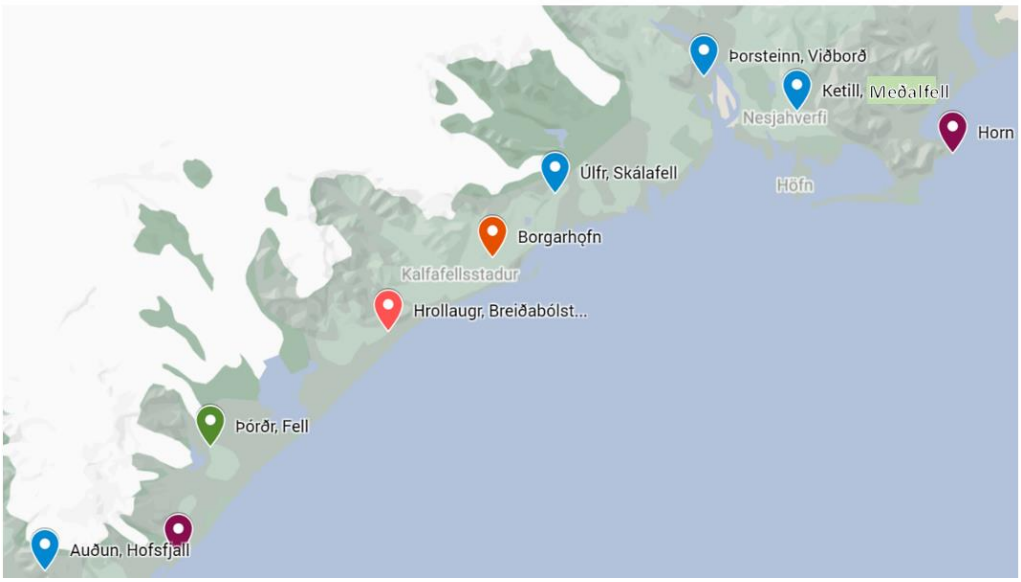


Figure 58 Locations associated with individuals in Figure 57

Auðun *enn rauði*, Úlfr *enn vǫrsk*i, Þorsteinn *enn skjálgi*, and Ketill are all secondary settlers who purchase land from Hrollaugr; their farms are in blue in Figure 58 (S311-S315). Þórðr *illugi* is a dependant settler and is granted land by Hrollaugr, *Þórðr illugi…;honum gaf Hrollaugr land milli Jǫkulsár ok Kvíár, ok bjó hann undir Fell við Breiðá* (green marker in Figure 58) (S315).

The nodes of Auðun *enn rauði*, Úlfr *enn vǫrski*, Þorsteinn *enn skjálgi*, Ketill and Þórðr's become the spokes of Hrollaugr's hub (Figure 57). None of these lesser settlers have direct relationships with each other and they can only reach each other's nodes in the network via Hrollaugr. If these men existed in 'real-world' Iceland it would be assumed that they were likely aware of each other due to their proximity, but this formation indicates that Hrollaugr was the main individual controlling the flow of information in the region. As the seller and giver of land, he can dictate who receives the land and create the social landscape to suit his sociopolitical needs.

Another more extreme example of the hub-and-spoke model is Figure 59, which is comprised of individuals connected via Eiríkr (*inn*) *rauði*'s Greenland expedition. Eiríkr is the central node in Figure 59 because he leads the expedition to Greenland, not because he gives land to dependants like Hrollaugr. In Iceland, Eiríkr claims land with his father, Þorvaldr, before going to claim land in Greenland. The orange nodes radiating around Eiríkr's node are all individuals who were part of Eiríkr's expedition to Greenland and claimed land there (S92). There is no explicit indication that Eiríkr gave them approval to claim land or told where they should settler, therefore, it appears that settlement in Greenland is not altogether hierarchical. Nevertheless, the attention paid to Eiríkr in *S* suggests that he held some sort of higher social position than his shipmates.

The only orange node not attached to this group is Þorkell's. Þorkell also goes to Greenland with Eiríkr, but he is a man of extraordinary powers and is Eiríkr's cousin (S93). These relationships explain his closer position to Eiríkr in Figure 59. Another settler, Ingólfr *enn sterki*, is connected to Eiríkr because Ingólfr hosted Eiríkr for a winter (S89). He is not the hub of this subgroup because he does not have as many relationships with other settlers as Eiríkr. Regardless, Ingólfr has some sway in the region because he not only temporarily houses Eiríkr, but he also grants his kinsman Herjólfr land in Iceland (S91). Thus, Ingólfr creates another settler-settler relationship and reestablishes familial ties in Iceland via land donation.

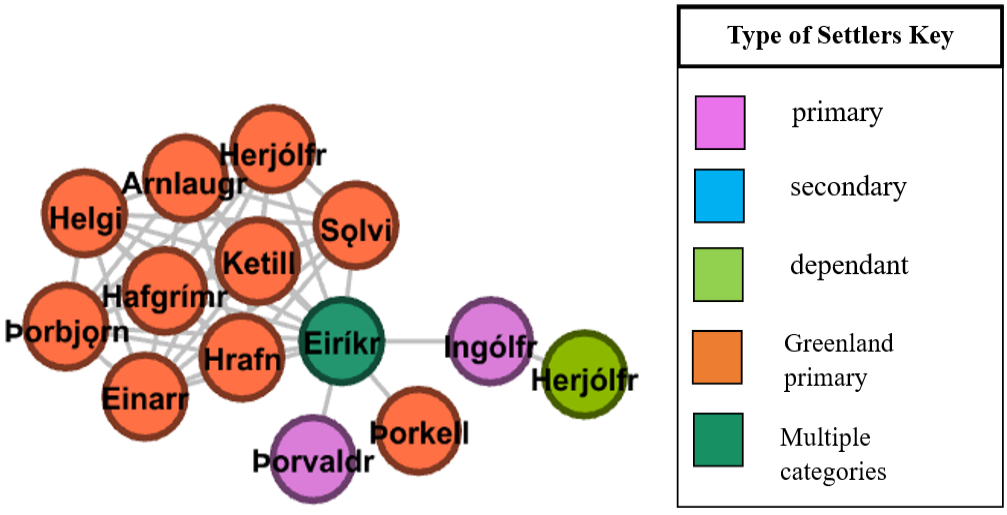


Figure 59 Hub-and-spoke formation with Eiríkr as the hub

5.3.1.c.iii Main subcomponent of primary, secondary, and dependent settlers: support for the Skalla-Grímr model of settlement?

Figure 60 is the main subcomponent that emerges when only settlers are visualised. It is comprised of a series of hub-and-spoke formations. At the centre of each formation there is a prominent settler—indicated by the black arrows and labels.

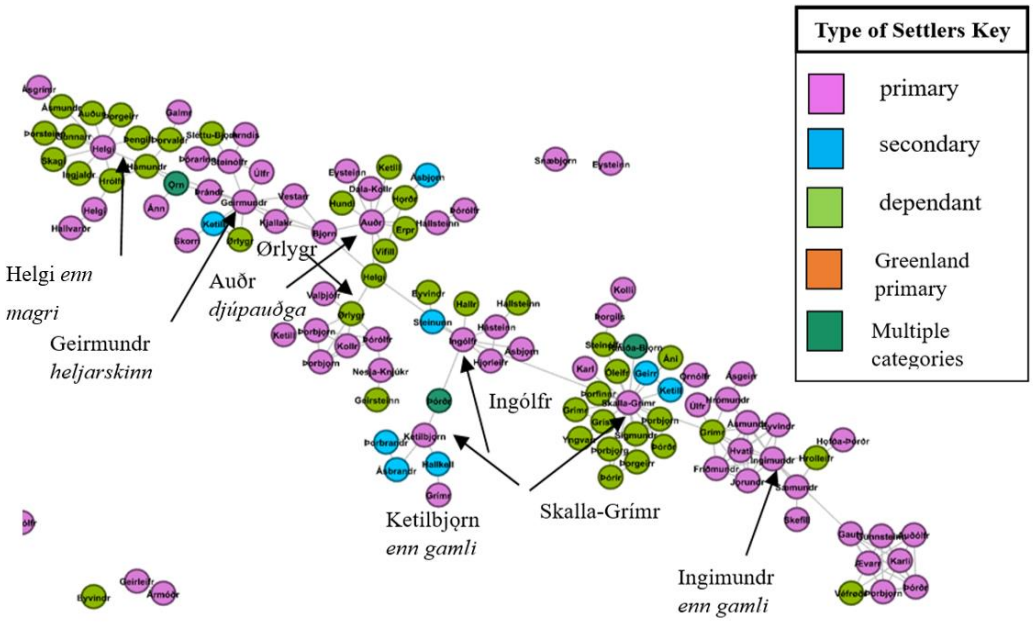


Figure 60 Main subcomponent of landnámsmenn in settler-only network

At first glance, this arrangement appears to support the 'Skalla-Grímr model/effect' of settlement (Byock 2001; Orri Vésteinsson et al. 2002; Zori 2014). This model is based on the methods used by Skalla-Grímr to establish control over the Mývatnssveit in chapter twenty-nine in *Egils saga* (ÍF II). He installed dependant settlers at subsidiary farms to collect valuable resources, i.e. stationing people in the mountains for sheep-farming. It has been argued that this scene—although hyperbolised—might reflect 'how emergent chiefs might have used bestowal of land to consolidate their power in the newly settled Icelandic landscape' and 'provides a mechanism for the rapid, wide dispersal of small sites over a large area' (McGovern et al. 2007, 35; Zori 2014, 56). This Skalla-Grímr model seemingly extends to *S*—which also includes

Skalla-Grímr's *landnám* narrative—in the form of hub-and-spoke formations (see above).

Figure 61 is a magnified view of Skalla-Grímr's section in Figure 60. Skalla-Grímr's node serves as a hub for secondary and dependent settlers. These *landnámsmenn* are dependent on Skalla-Grímr for not only land, but also for social connections. Skalla-Grímr is the conduit in which all the settlers in the region cannot only get in touch with each other, but also with the wider social network of settlers across Iceland. If one of these settler's connections with Skalla-Grímr is removed, that individual is at a high risk of being disconnected from the settler subcomponent.

Skalla-Grímr achieves this central position by specifically placing people where he wants them in his claim under the guise of gifting/granting land. Through these gifts he creates bonds of obligation which the dependants must fulfil through farming, smithing, etc. for the main farm, Borg. This is explicit in *Egils saga*, but implicit in *S* based on how Skalla-Grímr interacts with individuals of different social statuses.

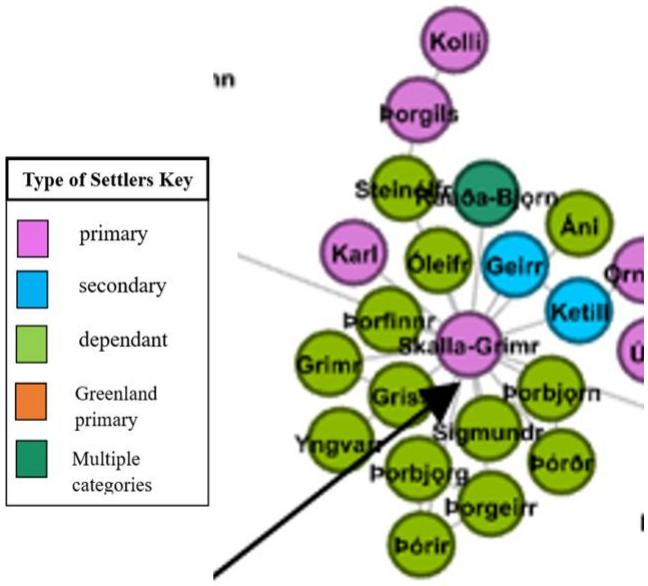


Figure 61 Skalla-Grímr's node as a hub surrounded by other settlers

Skalla-Grímr gifts his freedmen Gríss, Grímr, and Sigmundr land, strategically placing them in the landscape (S56, S58). The combined manumission and land grants create a strong sense of dependence between these men and Skalla-Grímr. Outside of their relationships with Skalla-Grímr, these individuals have virtually no other relationships in *S* and have no named descendants. This suggests that upon their death the land would revert to Skalla-Grímr's family's ownership. Alternatively, they could be phantom settlers—settlers with no relationship—used to amplify Skalla-Grímr's perceived power in the narrative and fill the landscape (see 5.6).

Yet another freedman, Flóki, not pictured in Figure 61, presents an interesting case because he took land in Skalla-Grímr's claim without Skalla-Grímr's approval (S34). Flóki's absence in this cluster suggests that his settlement in the southern part of Borgarfjǫrðr was not influenced by Skalla-Grímr (see 3.2.1.a). Therefore, Sturla was not entirely successful in attempting to demonstrate that Skalla-Grímr had total control over the entire Borgarfjǫrðr because it does not make sense as to why this freedman was not given land like the three others in Skalla-Grímr's claim. This is additional evidence showing that Skalla-Grímr and by proxy his thirteenth-century descendants do not have strong relationships—or at least the upper hand in these relationships—with settlers and their descendants who settled east of the Norðrá (see Figure 14; Smith 1995, 321).

In the two instances where Skalla-Grímr gives approval or tells individuals where to claim land, they are to men who hold a higher social status than freedmen (S35-S36). Óleifr *hjalti* is a *maðr gǫfugr* 'man of great distinction' and wintered with Skalla-Grímr before seeking approval. Ketill *blundr* and his son Geirr also overwintered with Skalla-Grímr and Geirr married Skalla-Grímr's daughter, Þórunn. The men were told where to settle by Skalla-Grímr, making them secondary settlers because they marry into his family and do not need to seek approval, therefore, are closer in status to Skalla-Grímr. This might indicate that even amongst secondary and dependent settlers there are further distinctions to be made using the more well-defined types of settlement categories (see 5.3.1).

Collectively, these different settlement methods place Skalla-Grímr as the hub of his local network comprised of individuals in a contained geographical region. However, it is important to point out that there is criticism to this model. McGovern et al. (2007, 35) note that the settlements in early-tenth-century Mývatnssveit 'are not isolated dwellings of salmon-fishing hermits but fully established farms with resident lineages wealthy enough to fund elaborate burials of their ranking members'. *S* is manipulating the memory of settlement in the region, reducing the level of detail of land-claim narratives to reinforce the remembrance of power dynamics—whether accurate or embellished. This is further compounded when comparing the relationships between Skalla-Grímr's section in *S* with his settlement in *Egils saga* using Figure 62, Skalla-Grímr's complete ego-network in *S* (ÍF II 27-30).

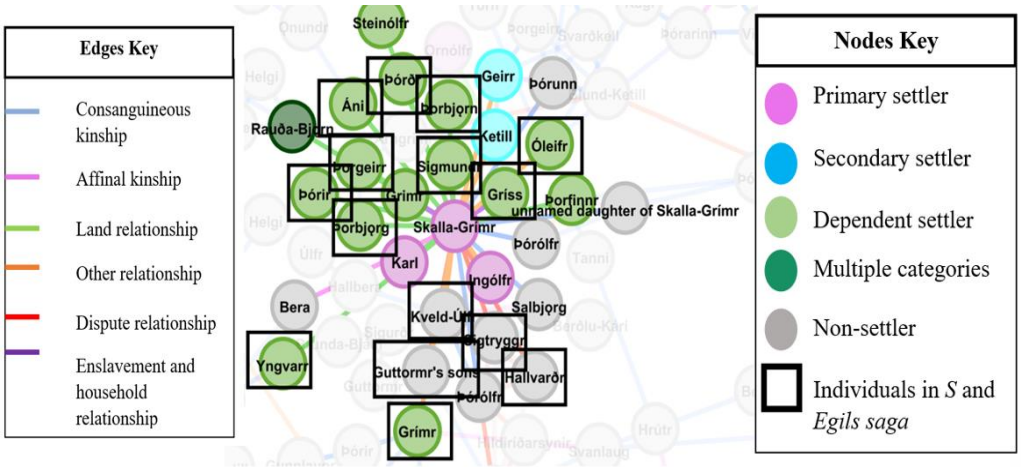


Figure 62 Skalla-Grímr's ego-network in Sturlubók's narrative network

Although the land-claim boundaries are different in *Egils saga* and *S*, how the relationships are described in both of Skalla-Grímr's settlement narratives are nearly identical. The settlement narratives both begin with Skalla-Grímr and his father, Kveld-Úlfr, killing Sigtryggr *snarfari*, Hallvarðr *harðfari*, and Guttormr's sons, forcing them to leave Norway for Iceland. There is an overlap between shipmates in both texts: Áni, Þorbjǫrn *krumr*, Þórðr *beigaldi*, Þórir *þurs*, Þorbjǫrg *stǫng* and Grímr *enn háleyski*.[92] These individuals are all given land in *S* by Skalla-Grímr and reside in roughly the

[92] Þorbjǫrg *stǫng* is known as Þórdís *stǫng* in *Egils saga* and is the daughter of Þórir *þurs*, in *S* she is recognised as Þórir's sister (S61; ÍF II 28n3).

same locations as their *Egils saga* depictions. There are only three men in *Egils saga* who are mentioned as part of Skalla-Grímr's convoy that are not part of his ego-network in *S*: Grímólfr who lived at Grímólfslœkr; his son, Grímarr who lives at Grímarsstaðir; and Grani, who farmed at Granastaðir (ÍF II 28n2 pp.73-4, 28n1-3 p.74).

Skalla-Grímr also places his freedmen, Sigmundr and Gríss, in roughly the same locations. Their fellow freedman in *S*, Grímr, does not appear in *Egils saga*. However, there is a counterpart named Oddr who serves a similar function to Grímr in *Egils saga*.

In both texts, Skalla-Grímr hosts Óleifr for his first winter in Iceland. Afterwards, Óleifr's settlement is slightly altered with Skalla-Grímr indicating (*vísaði*) where he should settle in *Egils saga*, whereas in *S* Skalla-Grímr gives him approval to settle (*at ráði*) (S35; ÍF II 29). Yngvarr also comes to Iceland and Skalla-Grímr gives him land in *S* and *Egils saga.*

Using SNA to visualise this conceptual arrangement of settlement relationships in *S*, result in Skalla-Grímr functioning as the hub in Mýrar with others seemingly dependent on him. As stated, the farms in his region besides Borg were probably comparable in status or slightly below. And realistically, if these settlers lived in the same region there would be more interactions between them, and they would not have to only rely on Skalla-Grímr to communicate with each other or the wider network of settlers. The lack of interconnectivity between these settlers is partially explained by the structure *S*. Since chapters often resemble the shape of genealogies, not as much attention is given to non-consanguineal and non-affinal relationships. Therefore, Figure 62 could be an extreme abstraction of historical socio-political dynamics in Borgarfjǫrðr, memorialising Skalla-Grímr as the main figure of memory, onto which other families can latch their origins. The more likely explanation is that Sturla manipulated the Skalla-Grímr's land-gifting relationships to reinforce his perceived social status which in turn enhanced Sturla's contemporary prestige as a distant descendant.

Sturla can manipulate the text in this manner because land relationships are more flexible than consanguineous and affinal kinship relationships. The association of an individual or group to a particular place in the Icelandic landscape must still be recorded, but how they acquire the land can be altered to reflect a desired power dynamic. Altering a kin-based relationship type would disrupt an entire genealogy—which would be a concrete entity in the medieval Icelandic social consciousness. For instance, Grímr *enn háleyski* was an independent settler according to *Vatnsdæla saga* and in the *M* redaction of *Ldn* but is a dependent settler in *S* (ÍFVIII xxxv, 10; Ashwell and Jackson 1970, 160). In all accounts, Grímr *enn háleyski* is a settler who settles in Borgarfjǫrðr and these name elements serve as fixed figures of memory. These elements cannot be reworked, or the source material can be called into question by the audience.

Conversely, how Grímr *enn háleyski* acquires his land can be embellished because people may have different perceptions of a land-transaction or who is the rightful owner of a claim. This means that other settlers who are listed as Skalla-Grímr's dependents in *S* could theoretically be independent settlers if the joint settlement scene and their land-based relationships with Skalla-Grímr are removed, thereby decreasing Skalla-Grímr's overall influence in the text. However, even if these land-based connections were taken out, he would still be an important individual in the network because he has a high number of consanguineous and affinal kinship relationships as well as those of enslavement and dispute. A full investigation of each of these land-based relationships would need to be carried out to see if Figure 62 is more of an abstraction of 'real' political structures or heavily manipulated by Sturla. What can be said at present is that SNA and the visualised ego-network support the internal logic of *S* that Skalla-Grímr is perceived as an important individual.

Yet the Skalla-Grímr model is not a one-size fits all approach, it only applies to Skalla-Grímr and the individuals in his land-claim. Although Helgi *enn magri* exerts a similar level of control in his subgroup in Figure 60, the clusters of other settlers functioning as hubs like Auðr *djúpauðga*, the primary

settler of Dalir in Western Iceland, and Ørlygr *enn gamli* do not follow similar distribution patterns (see 6.3.2.a-b for discussion of Auðr, see 5.2.1 for Ørlygr' settlement, and 5.3.1.c.iii.1 and 5.4 for Auðr and Ørlygr as important settlers and descendants of Bjǫrn *buna*). Figure 63 shows the respective magnified settler-only networks of Auðr and Ørlygr from Figure 60.

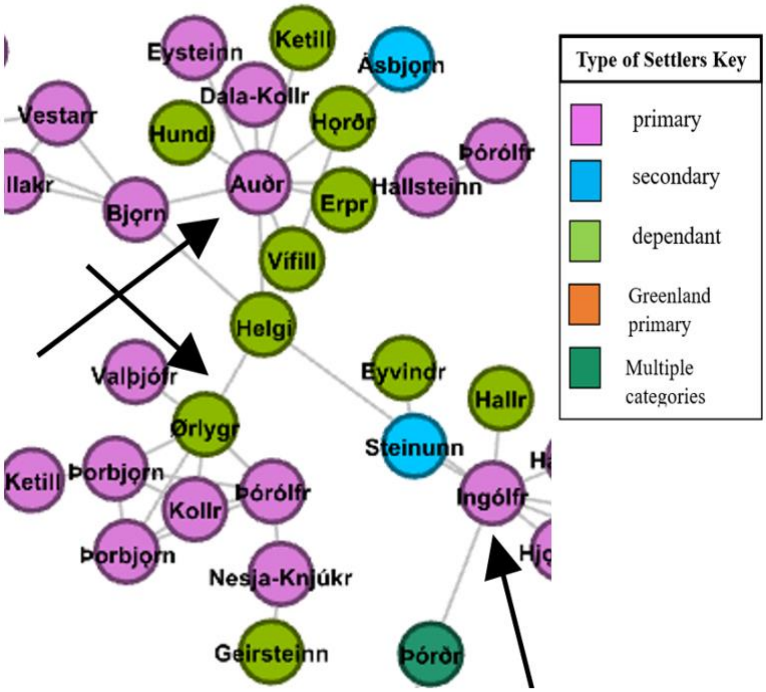


Figure 63 Locations of Auðr and Ørlygr's nodes in the settler's-only network

In Figure 63 Auðr's and Ørlygr's subgroups take on different shapes than Skalla-Grímr's. Auðr's network contains a mix of primary and dependent settlers indicating that she might not have total control over the Dalir region. Furthermore, her cluster is not as dense indicating that she does not interact with as many settlers as Skalla-Grímr. In Ørlygr's case, he is a dependent settler surrounded by primary settlers because he leads the expedition from Iceland and receives land from his cousin Helgi *bjóla*, but his shipmates settle in another region (see 5.2.1.c). What can be said is that most prominent settlers will be surrounded by less-prestigious individuals, but these relationships take several forms. These different organisational patterns just emphasise the need

to analyse settlement at the local level before making generalising patterns like the Skalla-Grímr model and SNA has initially identified the settlers and regions that can be studied in more detail in the future (Callow 2020, 313).

5.3.1.c.iii.1 Network emulating the text?

Another overarching pattern of settlement that emerges when analysing the main subcomponent of settlers-only network in Figure 60 is that the *landnámsmenn* serving as hubs are explicitly mentioned as some of the most prominent settlers in the concluding chapters for each Quarter (see 3.2.2.c). Starting from the leftmost hub identified in Figure 60 these settlers are: Helgi *enn magri*, Geirmundr *heljarskinn*, Auðr *djúpauðga*, Ørlygr *enn gamli*, Ingólfr Arnarson, Ketilbjǫrn *enn gamli*, Skalla-Grímr, and Ingimundr *enn gamli*.

These specific individuals visualising as hubs in Figure 60, confirm pre-conceived expectations from close readings of *S* of who would be important during the *landnám* and be expected to show up in prominent positions in visualisations. In other words, the graphic organisation of these interconnected hub-and-spoke models emulates the internal logic of *S. S* explicitly states that Helgi *enn magri* is one of the main settlers of the Northern Quarter; Auðr *djúpauðga*, Skalla-Grímr, and Geirmundr *heljarskinn* are among the noblest settlers of the Western Quarter; and Ingimundr *enn gamli*, Ketilbjǫrn *enn gamli*, Ørlygr *enn gamli*, and Ingólfr Arnarson are some of the outstanding settlers from the Southern Quarter (S170, S262, S397). Helgi, Auðr, Ørlygr, are also mentioned as some of the earliest Christian settlers in the final chapter of *S* (399; see 5.5.3.b.i.1).

But are the hub-and-spoke formations and large subcomponent of settlers a result of SNA or Sturla? The continued emphasis on these individuals throughout *S* (i.e. conclusion chapters, extended land-claims) by Sturla could accurately reflect their perceived historical importance in medieval Icelandic collective memory. Thus, the idea that these settlers are hubs would accurately mirror their influence in their respective region. Alternatively, how individuals appear in network graphs may be a byproduct of the excellent literary craftsmanship of Sturla.

The physical layout of the network graphs demonstrates that the concluding chapters inserted at the end of each Quarter section effectively frame the audience's perceptions of who the main foundational figures of Iceland are. Mentioning select *landnámsmenn* in these conclusion chapters not only extends their personal *landnám* narratives beyond the geographical boundaries of their settlement to an entire region, but they also colonise more space in the physical manuscript. Thus, whether intentionally or unintentionally, these rich narratives alter the audience's perceptions of this select group by associating them with social, political, and/or geographical power. The reality of the situation is likely somewhere in between where these are recognisable figures in the collective memory of Icelanders, but their stories were deliberately emphasised by Sturla. As this thesis follows *S* specifically, the elevated importance of these settlers will be emulated in the visual distribution of nodes in settlers-only graphs like Figure 54 where these settlers are central according to Sturla's memory of the *landnám*. In the future, these distributions can be compared to other formations of settlers in the narrative networks of other *Ldn* redactions to see if these individuals have a continued monopoly over the memory of settlement, or if this memory was crafted by Sturla.

5.4 'Frá Birni er nær allt stórmenni komit á Íslandi': Bjǫrn buna's Influence on the Network of Settlers in Sturlubók

According to *S*, Bjǫrn *buna* was a Norwegian *hersir* 'chieftain' probably from Sogn, Norway. However, not much more of his background is known (S10). Despite only having a short biography and never setting foot in Iceland, Bjǫrn functions as a unifying ancestral figure in *S* from whom nearly 'all of the great men in Iceland descend', *Frá Birni er nær allt stórmenni komit á Íslandi* (S10; Callow 2020, 150).

This statement is backed up by the sheer number of Bjǫrn's descendants mentioned in the text. Callow (2020, 150n8) identified approximately 180 individuals as direct descendants of Bjǫrn's son, Ketill

flatnefr (see ÍF I Ættarskrár I, II, IIIa-b).[93] About 120 of which are descendants of Ketill's daughter, Auðr *djúpauðga*—a hub in Figures 60 and 63—and sixty via his son, Bjǫrn *enn austrœni*, both of whom are prominent *landnámsmenn* and rank highly in centrality measures (see 5.5). Bjǫrn *buna*'s other two sons, Hrappr and Helgi, combine to have around 106 descendants. It is also important to stress that the differences in their respective numbers of offspring 'is more likely to represent the interests of the people recording them rather than the real numbers of descendants of each child, or even the claims of particular groups to be descended from a particular child' (Callow 2020, S150n8). Ketill's children form only one offshoot of Bjǫrn's genealogy, so collectively his progeny makes up a large percent of *S*'s narrative network.

Using the law of geometric progression, Hume (1973, 603) estimated that Bjǫrn would have had 'something like eight thousand descendants living at the close of the thirteenth century, even if no member of the family ever had more than two children who succeeded in having children of their own'. Of course, these numbers are in no way representative of actual population statistics for any period in medieval Iceland. However, this extrapolation demonstrates that a substantial number of medieval Icelanders would have been able to claim ancestry from Bjǫrn by the thirteenth century based on the numbers presented in *S*. This is because each generation of a genealogy doubles when tracing back from the previous generation—two parents, four grandparents, eight grand-parents, etc.—resulting in overall ancestral expansion over extended periods (Chang 1999, 1010-1). Therefore, whether Bjǫrn was a real or fictional ancestral character does not matter. What does is that a decent number of individuals living during the period of *S*'s compilation could construct unbroken genealogies either tracing back to Bjǫrn or one of his progenies to make their desired connections. This act would legitimise and enhance their social status because a descendant could provide evidence of their connection—even if it was a bit tenuous—creating cognitive links between their contemporary role in society and their illustrious ancestors. Yet, although many individuals might have been able to claim descent from Bjǫrn,

[93] See also Sigurður Nordal (1942, 111-20) for more discussion on Bjǫrn *buna*'s descendants and an extended genealogy tracing his descendants into the Commonwealth.

genealogies are still restrictive in the sense that a person must meet certain familial or affinal criteria to be considered a member of a family and that the connection must be socially accepted to be perceived as valid. Thus, not all individuals in medieval Iceland can be related to Bjǫrn and this is evident in *S* where clusters of his descendants appear in network graphs indicating that his family are conceptualised near the top of medieval Iceland's social hierarchy. This revives the question posed by Callow (2020, 150) of 'why was Bjǫrn *buna* important and to whom?'.

Bjǫrn's importance reflects some of the socio-political interests of one or more of the compilers of *Ldn*, Ari Þorgilsson, Stymir Kárason or Sturla Þórðarson (Callow 2020, 150; see 1.3.2.b). These men are from the west of Iceland and most of Bjǫrn's descendants in *S* reside in mid-west of Iceland particularly around Hvammsfjǫrðr. It is still difficult to discern whether Bjǫrn's genealogies are 'spurious' and crafted in the style of continental Europe, or if they derive from genuine oral tradition from the mid-west of Iceland (Callow 2020, 150-1). However, it can be said with more confidence that Bjǫrn was the lens through which some elite Icelanders not only conceived their own genealogies, but also the social, spiritual, and legal role they played in society. This is demonstrated by almost all the individuals who function as hubs in the main subcomponent of the settler-only network, Figure 60, having some connection to Bjǫrn *buna* and these relationships are shown in Figure 64.

Hub	Relation to Bjǫrn *buna*
Helgi *enn magri*	Married Þórunn *hyrna*, Ketill *flatnefr's* daughter
Geirmundr *heljarskinn*	Brother of Hámundr *heljarskinn* who married Helgi *enn magri*'s daughter
Auðr *djúpauðga*	Granddaughter
Ørlygr *enn gamli*	Grandson
Ingólfr Arnarson	In *S*, Ingólfr is not a direct descendant of Bjǫrn *buna*; however, this genealogy is thought to be incorrect and altered by Sturla. In *Þ*(*M*), Ingólfr is said to be the son of Bjǫrnólfr, the son of Helgi and grandson of Bjǫrn *buna*, not Arnar (ÍF I lxxi, *Þ*(*M*) 9, JJónGLdn 133-4). Jón Jóhannesson argues that this is the more plausible lineage and is directly taken from *Styrmisbók* although it is unknown why Sturla made this change.
Ketilbjǫrn *enn gamli*	Married Helga, Bjǫrn *buna's* great-granddaughter (S11)
Skalla-Grímr	Friend of Ingólfr

Figure 64 Hubs in Figure 58 and their relationship to Bjǫrn buna

The visual arrangement in Figure 60, in combination with centrality measures—see 5.5—and textual evidence supports previous narratological, legal, and historical analysis that Bjǫrn's descendants were not just 'important actors in the legal, political, social and spiritual history of the island', but they also were used to 'fuse the island's settlement and legal mythologies into an ultimate foundation narrative' (Long 2017b, 85; see also Sigurður Nordal 1942, 111-20; Callow 2020, 150-1). Interlinking the genealogies of important *landnámsmenn* to one individual and then associating this group the overarching settlement narrative of Iceland, constructs and historicises a 'proto-elite kin group', part of which can be seen in Figure 60 (Long 2017b, 128). In this sense, *S* becomes a self-

fulfilling prophecy where contemporary socio-political leaders influence the oral and/or written depictions of important individuals—often their ancestors—in the *landnámsöld.* These settlers whether historically significant, only described as being important (but not in reality), or created altogether, must still fit within the abstract framework of settlement to be socially accepted. Narrative description saying that a *landnámsmaðr* is one of the noblest born or that they are outstanding is not enough evidence to prove that they were. A settler's actions like creating dependents in their land-claim or entering a marriage with another prominent family in *S* give them more perceived authority.

Sturla cannot entirely alter the historical framework and literary tradition in which *S* was written, he must operate within its confines; this does not mean he cannot manipulate aspects of history or employ narrative devices (see 4.2). Through additional narration, Sturla amplifies the present audience's interpretations of Bjǫrn's descendants and other settlers he wants to promote. In other words, he is not inventing the process of settlement in Iceland nor likely most of the individuals in the text, but he is fabricating a new perception of settlement which is infused with his and his family's social, political, and geographical motivations—whether intentional or formed from inherent bias.

The credibility of the construction of a recognisable hierarchy is dependent on whether the audience can recognise social stratification in the text. The network graphs are in no way entirely representative of a medieval Icelander's mindset, but they demonstrate that there is a distinguishable order of settlers in the text which is also identifiable from close readings. The hub-and-spoke examples like Skalla-Grímr (Figure 61) and Hrollaugr (Figure 48) demonstrate that certain settlers hold power in a specific geographical region and extending from this main farm are secondary and dependent settlements. The patterns in network graphs imply that there was a clear awareness of power structures and inequality both in the *landnám* as well as those in the thirteenth century and at minimum a recognition and acceptance that certain *landnámsmenn* were

higher in social and political status than others. These differences in power and importance can more clearly be seen when quantitative measures like centrality measures are applied to the entirety of *S*'s population and most of the central players like Bjǫrn's descendants rank unsurprisingly towards the top.

5.5 Centrality: Are Landnámsmenn the Most Important Individuals in the Narrative Network of Sturlubók?

5.5.1 Centrality

Centrality measures are tools used to identify the nodes who are the most structurally important in the network i.e. does this node control the flow of relationships, does it have a high number of connections. In general, centralisation reveals a node's 'power, influence, visibility, or prestige' by measuring the extent to which the edges of the network are concentrated on a singular node or a group of nodes (Knoke and Yang 2020, ch. 4). It is worth applying centrality measures to determine if *landnámsmenn* are the most structurally important group in *S*, or if there are other individuals/groups who hold this distinction. Different centralities are applied to the narrative network of *S* to assess different aspects of the network's structure and four of the main centrality measures are: degree centrality, eigenvector centrality, betweenness centrality, and closeness centrality.[94] Each of these four metrics achieves the same objective of estimating the importance of nodes within a network, but they do not measure the same thing. How each metric is employed is described in detail below.

The outcomes of each metric can be interpreted differently based 'on the context in which they are used, and the choices made to build the graph being considered (what do vertices and edges represent?)' (de

[94] Centrality measures are calculated in *Gephi* using the Network Diameter and Eigenvector centrality features (Brandes 2001).

Valeriola 2021, 88).[95] Therefore, centrality measures cannot be applied as a one-size-fits-all approach and scholars must be aware of the constraints on their sources e.g. gaps and errors in the data that will alter the results obtained via centrality measures (ibid, 86). Additionally, centrality measures 'will always fail to detect those c. 20-30 per cent of actors whose influence does not correspond with above average connectedness' (Düring 2016, 100). Therefore, traditional philological and historical approaches must be used to interpret centrality results to see if people who are important to the network structure have gone undetected or if an individual was ascribed too much importance by the measure. Nevertheless, for *S* centralities are ideal quantitative metrics to apply because of the interconnected nature of its genealogical and geographical structure.

5.5.2 Degree Centrality

Degree centrality counts how many direct edges a node has to other nodes in the network.[96] For example, if Þórdís is in a relationship with Þorgerðr and in another with Grímr, but she is connected to no one else in the network, she has a degree centrality of 2 because only two edges converge on her node in the network. The higher degree centrality a node has, the more connected that individual is and the less dependent that individual is on other people. The major flaw of degree centrality is that it is susceptible to network size, i.e. comparing nodes from one social network to another social network (Knoke and Yang 2020, ch 4). For instance, a node that has a degree centrality of 19 in a network of twenty individuals is more well-connected in their network than a node with the same degree centrality in a network of 200 individuals. The present study is limited to the network of *S*, therefore, this is not an issue.

[95] See de Valeriola (2021) for discussion of how to apply centrality measures to historical sources.
[96] In-degree or out-degree centrality measures are not used in this thesis because they require directed graphs and all networks generated for this thesis are undirected.

5.5.2.a. Degree centrality: visual analysis

5.5.2.a.i King Haraldr's reign over *Sturlubók*

Figure 65 is the network visualised by degree centrality. The larger a node is in the graph, the higher its degree centrality and the more connections that node has. The largest node in Figure 65, indicated by the pink arrow, belongs to a non-settler, King Haraldr *enn hárfagri*. The prominent position of his node in the network mirrors his role in the text. Arguably he is the only individual whose importance supersedes those of *landnámsmenn* at a network-wide scale. This is a result of his role in the Icelandic settlement narrative as the 'tyrannical, avaricious king' who incited 'noble, honourable' individuals to migrate and create a new, legitimate society (Long 2017b, 87). Paradoxically, this depiction comes 'at the same time that Icelandic chieftains increasingly looked to the Norwegian kings to support their bid for power within Iceland' (Sverrir Jakobsson 2016, 17-8).[97] Therefore, the socio-political concerns of thirteenth-century Icelanders cannot be fully disentangled from the depiction of settlement in *S* unless kin relationships are studied at the group and individual levels across different time periods.

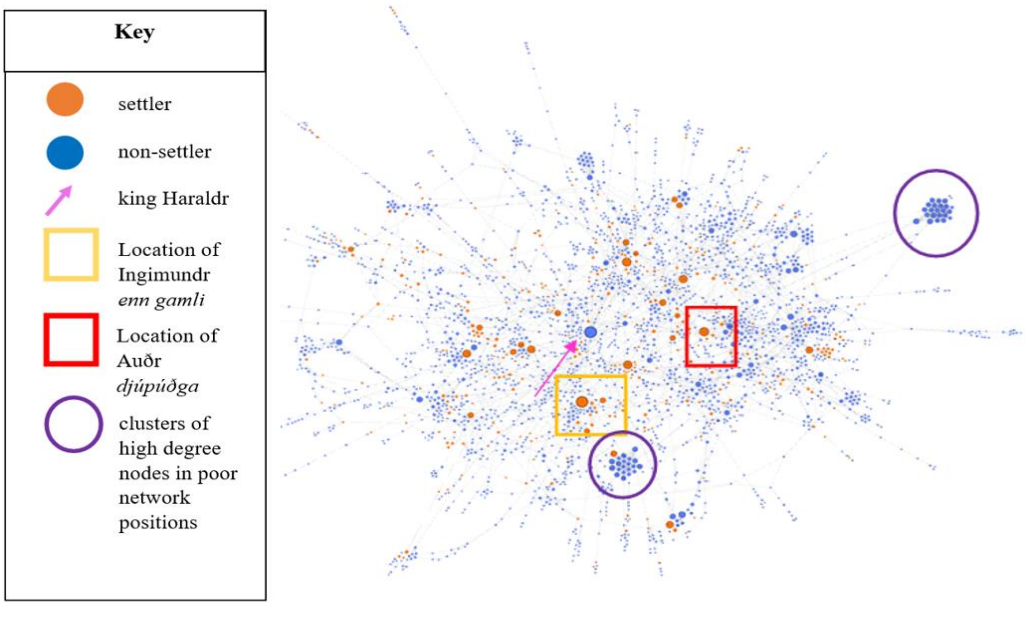


Figure 65 Sturlubók's narrative network resized by degree centrality

[97] 'This dichotomy can be explained by the fact that the existing versions of *Landnámabók*, of which the oldest, *Sturlubók*, was probably composed in the 1270s, were based on many different sources' (Sverrir Jakobsson 2016, 186).

Nevertheless, Haraldr functions as a fixed figure of memory in *S* around which people can arrange their migration narratives because he serves as multitemporal marker. He both represents a shared Norwegian past for many settlers, a reflection of contemporary political and social concerns, and a foil for what future leadership in Iceland should not be. Additionally, his reign emphasises the 'the earliness of certain colonists' arrival' and heightens their status because there are not many 'real' chronological dates in *S* (Callow 2020, 162). Therefore, if a *landnámsmenn* is connected to King Haraldr, their contemporary descendants can show that their family has owned the land since his reign.

Overall, Haraldr's position in the network demonstrates that Icelandic society as depicted in *S* partially models itself on relational and political models imported from the homelands. Yet, Haraldr's largely negative portrayal indicates that contemporary Icelanders did not support the monarchical model, or did not like a king that had too much power. Therefore, this system had to adapt and transform once imported to Iceland as well as adjust to other external influences to be interpreted as a uniquely Icelandic system. The narrative network in *S* retains some elements of the previous system like hierarchies, but king-subject relationships are juxtaposed to the preferable primary-dependent land-holder/settler-non-settler power dynamics.

5.5.2.a.ii Prime positioning

There are few medium-to-large orange nodes like those in the yellow and red boxes scattered across Figure 65. This distribution indicates that a limited number of prominent settlers have high degree centralities, and they serve as hubs in a particular region of the network which corresponds to a geographical location (see below). It is anticipated that certain settlers would act as hubs because land-claims and genealogies are not given equal amounts of narrative description. People portrayed as being more prominent in *S* tend to have more opportunities to make connections in the text simply because they are given more narrative space over those perceived as being less-illustrious settler or not as famous descendants. This is evidenced by most nodes being barely visible in in Figure 65—both settlers and non-settlers.

However, degree centrality only shows how many connections an individual has, not where these connections are located. A person with a high degree centrality who appears in the centre of the narrative network is in a more advantageous position because they connect with people throughout the entire network, whereas a person with the same degree centrality, but located on the edge of the network is more limited in who they can reach in the network (Golbeck 2015, 221-35). For example, the sets of blue nodes circled in purple appear to have high degree centralities, but these groups are located on the periphery of the network. This is because these groups are not important to the structure of the network and the degree centralities of these individuals are artificially inflated. These clusters are formed of families with ten or more children who are only interconnected with each other and have very few relationships outside of their consanguineous kinship relationships (S106, S280). This indicates that having more children seems to enhance prestige because more children mean being perceived as having more relationships and there is the potential for them to create new relationships even if undocumented. Yet, these groups are self-contained and not important to the overall flow of relationships in the network. Henceforth visualisations and quantitative metrics will be adapted to account for when individuals' centralities are inflated in the metrics whether it be their number of children or impacted by another element.

The importance of network position also extends to settlers. Auðr *djúpauðga*'s node (red box Figure 65) is the largest within a highly connected, central area of the network and she acts a connector between other prominent individuals as shown in Figure 66. On the other hand, Ingimundr *enn gamli*'s node is not in the 'middle' of the network (yellow box) which may indicate that he holds a significant amount of regional power but is not as influential at the network-wide level as Auðr. The magnified view of his position, Figure 67, shows that his node is significantly larger than those that closely surround him. This pattern suggests that individuals in his area of the network are likely more dependent on him than people in Auðr's region who in general have more connections. So, although Ingimundr and Auðr have similar node sizes and

high degree centralities their position in the network needs to be taken into consideration.

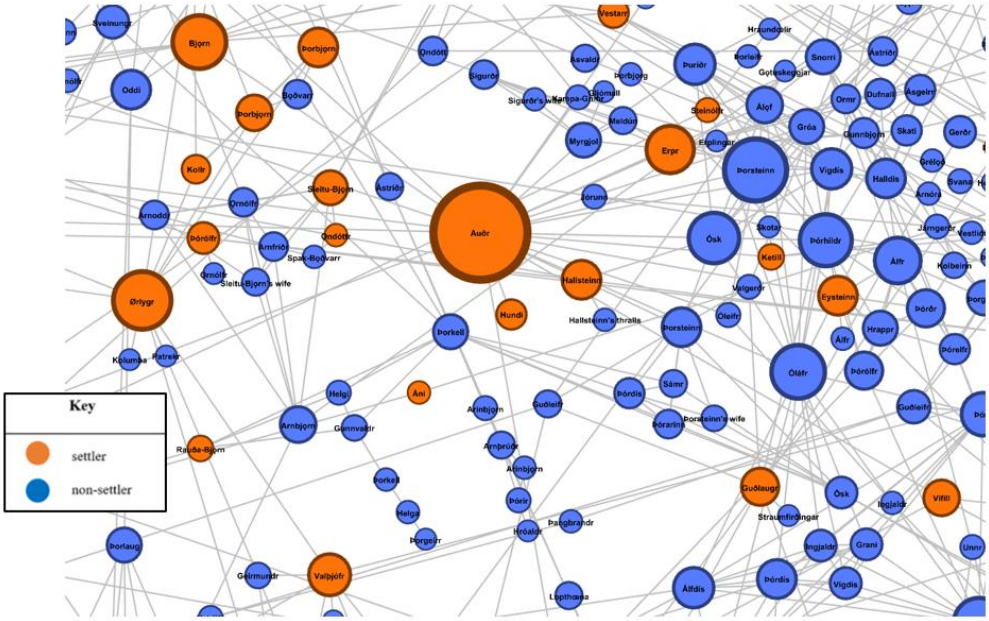


Figure 66 Auðr's node in the Figure 65, magnified

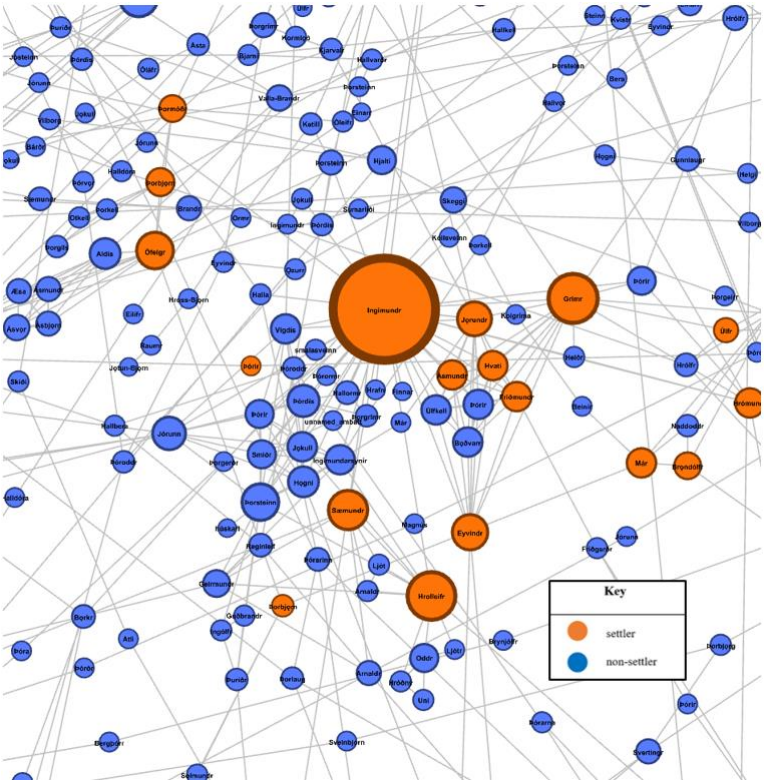


Figure 67 Ingimundr's node in Figure 65, magnified

5.5.2.b Degree centrality: quantitative analysis

Figure 68 lists the twenty-one individuals with the highest degree centrality in *S*'s narrative network. Unsurprisingly King Haraldr ranks the highest in degree centrality at 72 meaning that he has a direct relationship with seventy-two other individuals in *S.* Of this select group, fifteen are *landnámsmenn* (*ldm*).

Top Twenty-One Individuals in Network by Degree Centrality					
ldm=landnámaðr; cc= conclusion chapter					
Rank	***Individual***	***Degree***	***Rank***	***Individual***	***Degree***
1	King Haraldr	72	**12**	Álǫf *elliðaskjǫldr*	34
2	Ingimundr *enn gamli ldm*, cc	69	**13**	Guðrún Ósvífrsdóttir	33
3	Auðr *djúpauðga ldm*, cc	51	**14**	Hǫfða-Þórðr *ldm*, cc	31
4	Helgi *enn magri ldm*, cc	49	**15**	Hrólfr *ldm*	30
5	Skalla-Grímr *ldm*, cc	47	**16**	Hrollaugr *ldm*, cc	30
6	Geirmundr *heljarskinn ldm*, cc	45	**17**	Þorsteinn *rauðr*	29
7	Ketilbjǫrn *enn gamli ldm*, cc	43	**18**	Snorri *goði*	29
8	Ingólfr *ldm*, cc	41	**19**	Þorgrímr *þǫngull goði,* cc	29
9	Ásgerðr *ldm*	39	**20**	Hásteinn *ldm*, cc	29
10	Eiríkr *rauði ldm*	36	**21**	Hjǫrleifr *ldm*	29
11	Ketill *gufa ldm*	34			

Figure 68 Highest ranking individuals in narrative network by degree centrality

There is also a correlation between having a high degree centrality and being considered as one of the 'prominent' settlers in *S* in the Quarter summary chapters (see 3.2.2.b and 5.3.1.c.iii). Eleven out of twenty fall into this category: Skalla-Grímr, Auðr, and Geirmundr *heljarskinn* are considered the leading settlers of the West; Hrollaugr in the East; Ingimundr, Helgi *enn magri*, and Hǫfða-Þórðr in the North; and Hásteinn, Ketilbjǫrn *enn gamli*, and Ingólfr in the Southern Quarter (S170, S262, S335, S397). Additionally, Þorgrímr *goði* is noted to be one of the *hǫfðingjar mestir á Ísland* 'leading chieftains in

Iceland' after the *landnámsöld* in chapter S398, one of the conclusion chapters of *S* (see also 3.2.2.c). These eleven individuals are denoted by the cc (conclusion chapter) after their names in Figure 68.

The other individuals ranking highly in degree centrality include Þorsteinn *rauðr*, the son of Auðr, making him a descendant of Bjǫrn *buna*. Álǫf is the daughter of the settler Ásgerðr and she marries Þorbergr *kornamúli*, son of the settler Þorkell *kornamúli* and they have two children (S341). She also travelled to Iceland as part of a large group and has many siblings which contributes to her high degree centrality (see 3.5.2 and 5.3.1.c.i). Snorri *goði* is remembered as a prominent chieftain in the west of Iceland. His son Halldórr is the progenitor of the Sturlungs, making Snorri an ancestor of Sturla Þórðarson. In contrast to being the protagonist of *Laxdæla saga*, Guðrún Ósvífrsdóttir is barely discussed in *S* (ÍF V). Nevertheless, her four marriages to Þórðr, Bolli, Þorkell, and Þorvaldr are all documented and ten of her children are named resulting in her having a degree centrality of 33 (S84, S104, S119, S256).

Although outside the scope of this thesis, it is important to mention that most of the top twenty-one of degree centrality feature heavily throughout the ON-I corpus. This raises questions about the historicity of these individuals that cannot be answered at present. For instance, does the number of relationships an individual has in *S* reflect their status in 'real-world' medieval Icelandic society or in the collective memory of medieval Icelanders? Or are these people recognisable literary characters that enable multiple people to attach their genealogies to them thus imbuing them with a sense of legitimacy and prestige—even if this status is crafted?

5.5.2.b.i Degree centrality: geographic location

Mapping the locations associated with individuals with the highest degree centralities results in a near perfect circle of farms around the coast of Iceland as shown in Figure 69. The only regions which are not home to an individual with a high degree centrality are the Westfjords and the northeast of Iceland. The distances between each farm in Figure 69 suggest that boundaries between centres of power do not encroach on each other. The only areas where farms

cluster are in Eyjarfjǫrðr and Borgarfjǫrðr which indicates that there might be a few related individuals controlling the area or that in these places families are jockeying for power. Overall, this topographical distribution supports that these individuals and/or their residences serve as regional hubs serving as bridges between smaller farms in the region who are owned by farmers who are not as well-connected in the overarching network.

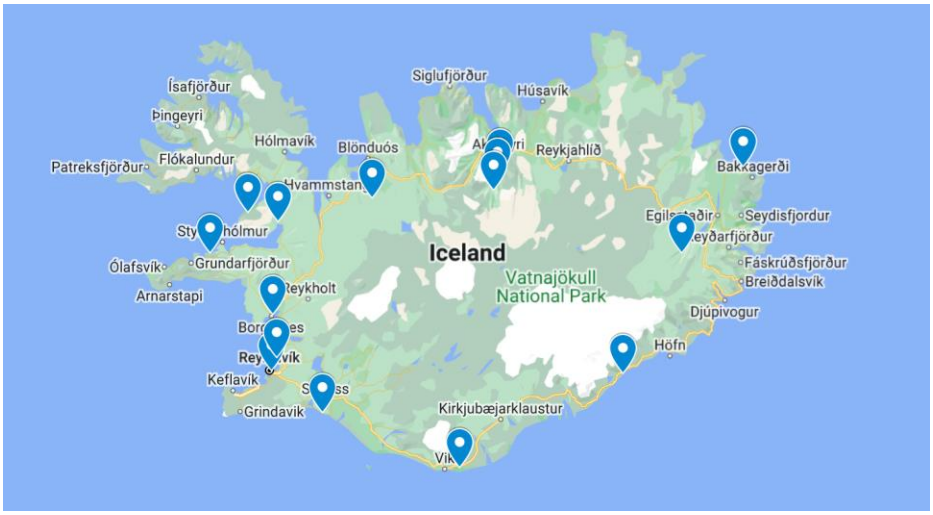


Figure 69 Locations in Iceland associated with individuals who have the highest degree centrality in the narrative network

5.5.3 Betweenness Centrality

Betweenness centrality detects nodes that influence the flow of information in a network by measuring the shortest paths of all nodes. The shortest path between any two nodes is the route which uses the lowest number of total edges to go from the source to target node. For example, if node Z is on the shortest path between nodes X and Y, it indicates that Z brokers the flow of information between the pair and that Z is the most efficient way for X to reach Y and vice versa. If Z is removed from the network, then information or goods would have to travel between more edges—a longer path—to get from X to Y in the network. Thus, the higher a node's betweenness centrality, the more influence that node has on the flow of information in a particular network. In this sense, the measure is also useful in determining what nodes serve as bridges, individuals who connect different parts of the graph together which otherwise have minimal to no contact. In the network of *S*, betweenness centrality

identifies individuals who are important in controlling connections between people and disseminating information within Quarters and throughout Iceland.

5.5.3.a Betweenness centrality: visual analysis

Figure 70 is a graph of the network where nodes are resized based on their level of betweenness centrality. The larger the node, the higher its betweenness centrality and ability to control the flow of information. King Haraldr's node has been removed from this graph because his insertion distorts the visualisation of the graph and detracts from the *landnámsmenn* who are holding power during the *landnámsöld*.

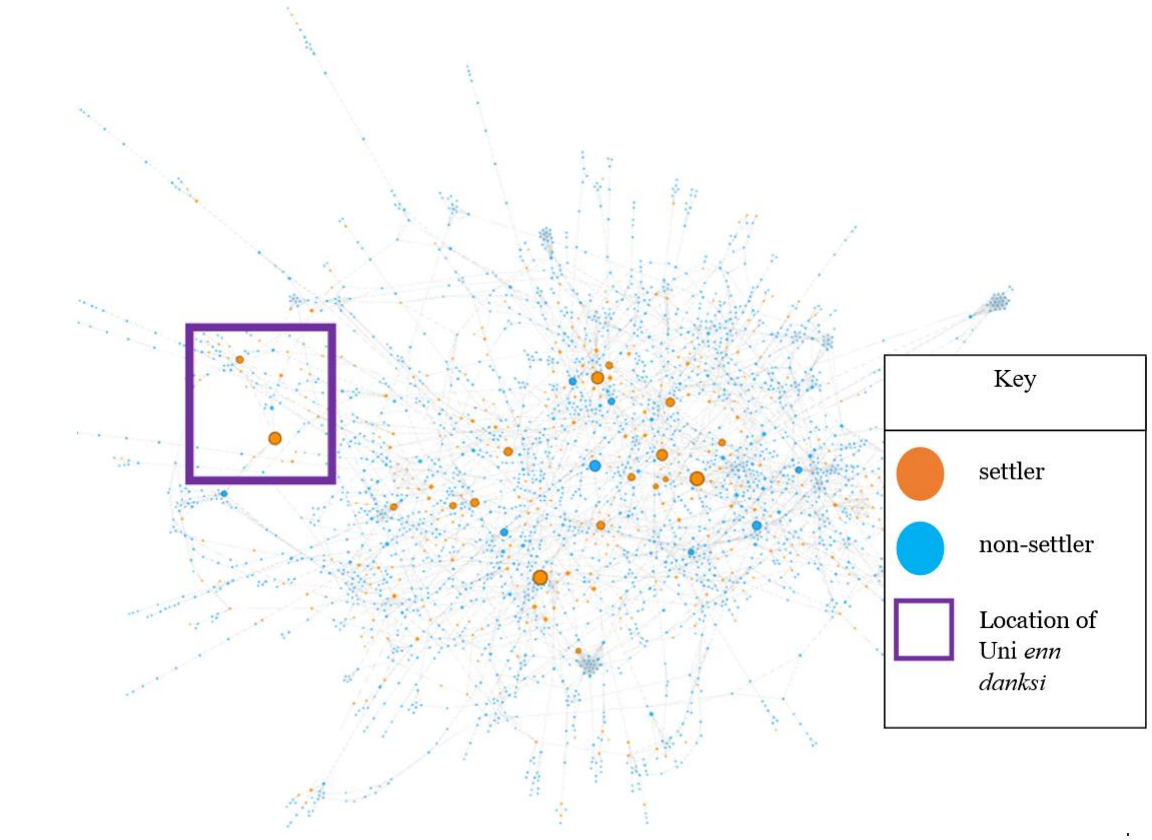


Figure 70 Narrative network resized by betweenness centrality

In Figure 70, there is an uneven distribution of medium and large-sized nodes in the graph which means that the flow of information is consolidated amongst a few individuals, mainly settlers who function as bridges in the network of *S*. The location of these nodes is ideal for establishing regional

power centres because they are centrally clustered, but not in the exact middle of the graph. This distribution suggests that these people had access to information from all over Iceland but filtered this news to their regional subgroups who are located closer to the periphery of the network. Most nodes in Figure 70—settlers and non-settlers—are small, showing that they have a low betweenness centrality. This demonstrates that these nodes would need to make use of a node with a high betweenness centrality to reach other parts of the network. Thus, the disparity between the small number of nodes that have a high betweenness centrality versus the large number of nodes that have low betweenness centrality again supports that there are regional hierarchies in *S* (see 5.3.1.c.ii).

The two large nodes in the purple box in Figure 70 appear to be outliers. They have high betweenness centrality, but they are positioned near the periphery of the network. Figure 71 is a magnified view of this area, the largest orange node in the area belongs to Uni *enn danski*. His high betweenness centrality is not because he is important to the structure of the network but is a result of being a weak connection between disparate groups in the text (S4, S280, S284). Usually, a high betweenness centrality indicates that someone holds authority over unrelated clusters in a network. In this case, Uni's node is located on the periphery of two distinct clusters creating a connection between them without having power in either group.

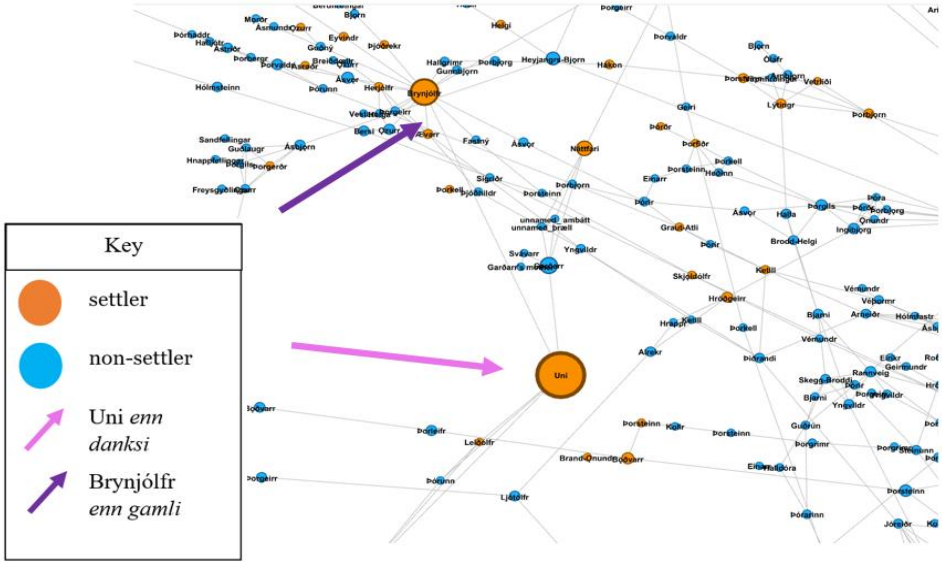


Figure 71 Uni enn danski's location in Figure 68, magnified

Uni is connected to Náttfari, a settler, through his father, Garðarr, one of the discovers of Iceland. He also has a strong connection to King Haraldr who gave Uni approval to settle in Iceland and incentivised him to bring Iceland under Norwegian rule with the promise of a jarldom. This makes Uni a middleman between the crown and Icelanders.

Once in Iceland, Uni attempts to settle in the east taking the entire region of Unalœkr; however, when people realise his true intentions, he is driven from the area. Brynjólfr, who represents the second largest orange node in Figure 71, even slices off a piece of Uni's land claim and gives it to a kinsman. Eventually, Uni arrived at Leiðólfr's at Skógahverfi where he became infatuated with Þórunn, Leiðólfr's daughter. She became pregnant with Uni's child and Uni attempts to run away twice. Leiðólfr caught him the first time, but on the second attempt kills Uni. Uni's son from this tryst, Hróarr *Tungugoði*, went on to become a prominent Icelander (S284).

Through a middleman like Uni, Icelanders like Brynjólfr indirectly have a relationship with King Haraldr, who they otherwise would be unable to reach in the network. Uni also acts as a narrative buffer allowing Icelanders to indirectly express their frustrations with Norwegian rule without facing retaliation. By forcing Uni to move and taking part of his land, they are not directly rebelling against the king, but only dealing with him through his intermediary.

5.5.3.b Betweenness centrality: quantitative analysis

Looking at the individuals in the top twenty in betweenness centrality listed in Figure 72, fourteen are settlers and eight of these individuals—Ingimundr, Auðr, Helgi *enn magri*, Geirmundr, Hrollaugr, Ingólfr, Skalla-Grímr, and Hásteinn—also rank highly in degree centrality.

Top Twenty Ranking Individuals in Betweenness Centrality					
ldm=landnámsmaðr					
Rank	***Individual***	***Betweenness Centrality[98]***	***Rank***	***Individual***	***Betweenness Centrality***
1	Haraldr	1648602.64122	**11**	Ingólfr *ldm*	232706.61319
2	Ingimundr *enn gamli ldm*	462596.61175	**12**	Skalla-Grímr *ldm*	230321.75004
3	Auðr *djúpauðga ldm*	441809.71221	**13**	Þórólfr	197575.12901
4	Uni *enn danski ldm*	441809.71221	**14**	Helgi *bjóla ldm*	193129.98219
5	Helgi *enn magri ldm*	374847.18267	**15**	Brynjólfr *enn gamli*	190157.64221
6	Bjǫrn *enn austræni ldm*	332885.46950	**16**	Hákon *jarl*	187728.86953
7	Ketill *flatnefr*	329153.57534	**17**	Hámundr *heljarskinn ldm*	187450.51622
8	Þórðr *gellir*	248375.33699	**18**	Kjallakr *enn gamli*	180498.13514
9	Geirmundr *heljarskinn ldm*	247160.30783	**19**	Þórunn *hyrna*	178112.57237
10	Hrollaugr *ldm*	233561.54725	**20**	Hásteinn *ldm*	169932.02317

Figure 72 Highest ranking individuals in narrative network by betweenness centrality

5.5.3.b.i A proto-elite kin group? Quantitative evidence for the importance of Bjǫrn *buna*'s descendants

Most of the individuals who rank in the top twenty of betweenness centrality are related to Bjǫrn *buna*, quantitatively supporting his family's importance in the network (see 5.4). Ketill *flatnefr*, the son of Bjǫrn *buna*, reconquered the Hebrides on behalf of King Harald. Ketill did not pay the king tribute in the islands, therefore, Haraldr confiscated all his land in Norway and banished his son, Bjǫrn *enn austræni* who was left in charge of his father's possessions (S10, S13). Bjǫrn *enn austræni* went to Iceland and settled at Bjarnarhǫfn, which his son Kjallakr inherits. Ketill's other children eventually join Bjǫrn *enn austræni* in Iceland. Auðr *djúpauðga* migrates and farms at Hvammr (see

[98] Rounded to the nearest hundredth-thousandth.

6.3.2). Her great-grandson Þórðr *gellir*, presumably inherited Hvammr considering his father Óláfr *feilan* was raised by Auðr and he only had sisters (S109). Auðr's son, Þorsteinn *rauðr* married Þuríðr, the sister of Helgi *enn magri* (S95). Helgi *bjóla* is also a settler; however, unlike his siblings he received approval from Ingólfr to settle in his land-claim (S14). Ingólfr also ranks high in betweenness centrality which is to be expected considering his status.

Even if he is not listed as a descendant in *S*, Ingólfr and his kin, the Reykvíkingar, are still closely intertwined with Bjǫrn *buna*'s. Ingólfr gave approval to Þórðr *skeggi*, son of Hrappr, Bjǫrn's son, to settle in his land-claim, after he moved away from his original settlement (S11, S307).[99] In turn, Helgi *bjóla* gave approval to his *brœðrungr* 'cousin' and Þórðr *skeggi*'s brother, Ørlygr *enn gamli* to settle within his land-claim which would still be within Ingólfr original claim (S15). Þórðr and Ørlygr both place in the top thirty of betweenness centrality demonstrating that alongside Ingólfr and their kinsmen they are part of a 'proto-elite kin group' (Long 2017b, 218).

Another daughter of Ketill is Þórunn *hyrna*, she married Helgi *enn magri*, one of the most influential settlers of the North. Their daughter Ingunn, married Hámundr *heljarskinn* who also received land from his father-in-law (S218, S230). After Ingunn died, Hámundr married Helga, another daughter of Helgi's (S232).

Hámundr *heljarskinn* is the brother of Geirmundr *heljarskinn* (S112). This link between brothers may be important because the only children of Geirmundr mentioned in *S* are Ýrr and Geirríðr who have different mothers, so his inheritance could be subject to multiple claims from Hámundr's line (Sigurður Nordal 1942, 117; S115). Geirmundr also quarrels with another high betweenness centrality individual, Kjallakr, over ownership of a cornfield; this dispute was reconciled by Vestarr of

[99] Þórðr *skeggi* also sells land to Úlfljótr, *er lǫg flutti út hingat* 'who brought the laws to Iceland' further linking Bjǫrn *buna*'s offspring to the creation and dissemination of law (S307, Long 2017b, 150-1).

Eyrr and Bjǫrn *enn austræni*. The correlation between being an ancestor/associate of Bjǫrn *buna* and having a high betweenness centrality suggests that this family operates as a proto-elite kin group in *S*. Since there are very few individuals outside of this group that also rank high in betweenness centrality, Bjǫrn *buna*'s kin effectively control the flow of relationships and information in the narrative network—if *S*'s network at some level functions similarly to a 'real-world' social network (see 6.4.4). In other words, individuals with low betweenness centralities would likely need to use one of Bjǫrn *buna*'s kin as an intermediary to reach another low betweenness individuals or to transmit information effectively throughout the network. *En masse* the kin group bridges parts of the network together, which otherwise would have no contact. In this capacity, this kin group is 'elite' because simply put they can either facilitate or block connections in the network.

5.5.3.b.i.1 Christian connections

The only child of Ketill *flatnefr*'s who does not rank in the top twenty in betweenness centrality is Jórunn *manvitsbrekka*, but she and her son, Ketill *enn fiflski*, still rank in the top fifty (S320). Ketill *enn fiflski* is identified as one of the earliest Christians of Iceland—a group largely composed of individuals associated with Bjǫrn *buna* including Auðr, Helgi *bjóla*, Ørlygr *enn gamli*, and Helgi *enn magri* (S399). Associating these individuals who lived before Iceland's conversion to Christianity (c.1000), imbues a sense of spirituality into their genealogy and cements their family's role in the Christianisation process. In turn this would legitimise their candidacy for clerical positions in the present and future. Conceptual links between the clergy and Bjǫrn *buna*'s lineage were already being made before *S* was compiled. Notably, *Íslb* lists the ancestries of some of the early bishops of Iceland, many of whom are related to Bjǫrn (*Íslb Ættartala*). For example, Þórlákr Rúnólfsson (d.1133), the bishop of Skálhólt, could trace his matrilineally back to Ketill *flatnefr*.[100] Jón Ögmundarson (d.1121), the first bishop of Hólar, descended from Ketill

[100] The diocese of Skálhólt was founded in 1056 and Hólar was established in 1106.

flatnefr on his father's side and his successor, Ketill Þorsteinnsson (d.1145), was a direct descendant of Helgi *enn magri* and Þórunn *hyrna* (Meulengracht Sørensen 1993, 45-7; see also BOI xiv-xvii for Ari's lineage, which features many of these individuals).

The physical location of the early Christians chapter in the text not only establishes Bjǫrn's family as leaders of Christianisation in Iceland, but also creates a cognitive association with his descendants and leaders in the North Sea region. S399 models itself after S2 which enumerates rulers throughout continental Europe and the British Isles during the *landnám*. These chapters along with other introductory and concluding material are part of a framing narrative which begins with an international list and ends with records of important Icelanders. Therefore, the similar narrative presentation in the form of lists creates a mental link between these select Icelanders and their counterparts across the North Sea.

This connection extends more generally, by demonstrating that these individuals chose to practice Christianity during a period of paganism it reinforces that Iceland had Christian roots even in the *landnám.* Though Christianity was practiced intermittently until conversion by showing these individuals had the choice to practice it also signifies that overall Iceland has a tradition of 'privileging thought, discussion, and consensus' (Mulligan 2019, 248-9). *S* highlights that the Icelanders were never forcibly converted by outside forces both individually and collectively. Instead, they chose to convert. In this way Iceland is not presented as a subordinate of all the locations mentioned in S2 including Rome in S2, but as an equal where their paganism is firmly in the past.

The only individual mentioned as an early Christian who does not have a clear connection to the family is Jǫrundr *enn kristni* (S23-S24, S399). In comparison to the others in this group he ranks very low in betweenness centrality. This suggests that even though he does not hold a lot of influence in the network or have many connections his association to

Christianity was so strong in cultural memory that he could be named alongside more recognisable figures.

5.5.3.b.i.2 Noble origins

Many of Bjǫrn *buna*'s descendants and their in-laws have origins in the British Isles. Ketill *flatnefr* conquered the Hebrides (S13). Helgi *bjóla* went to Iceland from the Hebrides and acquired a Gaelic byname which would have been 'understood by some in the early *landnám* phase in Iceland' (S14; Etchingham et al. 2019, 281-2). Ørlygr *enn gamli* was fostered by the holy Bishop Patrekr in the Hebrides (S15). Auðr married Óleifr *enn hvíti* who went on an expedition to the British Isles and conquered Dublin and its surrounding areas (S95). After he was killed, she and her son Þorsteinn went to the Hebrides where he married Þuríðr, daughter of Eyvindr *austmaðr* 'the easterner', who acquired his nickname because he went *vestr um haf ok vildi þar ekki staðfestask* 'west over the sea, but would never settle there' (S84). Þorsteinn then conquered most of Scotland before he was betrayed and killed. After her son's death, Auðr married off some of her granddaughters in Orkney, the Faroes and then moved to Iceland (S97). Her grandson, Ólafr *feilan*'s byname is likely Gaelic and is considered evidence of hybrid Irish-Icelandic oral tradition (Etchingham et al. 2019, 289). Helgi *enn magri* 'the lean' was another child of Eyvindr *austmaðr*. Helgi's mother was Rafǫrta, the daughter of Kjarvalr *írakonungr*, and he was fostered in the Hebrides, but returned so starved from the experience that he received his nickname and was then raised in Ireland (S217). He emigrated to Iceland probably coming from somewhere in the British Isles with Hámundr *heljarskinn*, Þórunn *hyrna* and his children (S218). Geirmundr *heljarskinn* also raided in the British Isles prior to settling in Iceland (S112).

The high betweenness centralities of these individuals indicate that they are bridges between communities in Iceland and the North Atlantic. The centrality of this group in *S* forefronts the shared history between the British Isles and Iceland which is expressed in the network via relationships connecting people who remain in the homelands and those in

Iceland. These links in addition to the prevalence of Gaelic names particularly among Bjǫrn's kin in *S* demonstrates that the compilers were highlighting 'a Gaelic element in their past to suit their contemporary needs', even if this motive is not presently clear (Etchingham et al. 2019, 363).

5.5.3.b.ii Betweenness centrality: geographic location

The locations of the individuals in Iceland with the highest betweenness centralities in Figure 73 almost overlap with those pattern individuals with the highest degree centralities (Figure 69). This indicates that power is being held by mainly the same individuals in the same locations. Here the Westfjords and northeast of Iceland are still empty, but there are also gaps in the south of Iceland and in Siglufjǫrðr. This distribution indicates that more individuals in the west and north bridge across to the east of Iceland instead of an intermediary being physically located in the south.



Figure 73 Locations associated with individuals who have the highest betweenness centralities

The distribution of farms in Figure 73 nearly matches the distribution of locations in Figure 74, a map showing the locations of farms associated with individuals related to or who have ties with Bjǫrn *buna*. This pattern suggests that these individuals sought to form clusters of communities spaced in strategic locations throughout Iceland to control the flow of information at least

across the north, west, and south of the country. Yet the east notably does not have a location associated with a descendant of Bjǫrn indicating that the east might not be under their control or that they did not conceptualise this area as a part of their social network.



Figure 74 Locations associated with individuals who have ties to Bjǫrn buna

5.5.4 Closeness Centrality

Closeness centrality measures the average shortest distance from each node to each other node. In other words, how 'close' an individual is to another individual in the network.[101] A node with a high closeness centrality score is well-integrated in the network, and able to reach all other parts of the network easily. Therefore, these nodes can disseminate information quickly. Having a high closeness centrality is not inherently positive. For example, when an infection spreads throughout a network, individuals with high closeness centralities are more likely to become a superspreaders; however, in the context of *S* high closeness centralities are generally positive. Nodes with low

[101] Algorithms for calculating closeness centrality vary across SNA software. Above is how *Gephi* measures closeness centrality.

closeness centralities must use multiple paths to reach other nodes in the network and they are not as well-connected**.**

5.5.4.a Closeness centrality: visual analysis

Figure 75 is a visualisation of the network where nodes are resized to reflect their closeness centrality. Larger nodes have a higher closeness centralities indicating that these individuals are 'close' to other nodes and can quickly access others in the network and vice versa, making them central figures. Smaller nodes have lower closeness centralities, and it takes them longer to get in contact with other nodes. King Haraldr is removed from this visualisation because he has the highest closeness centrality in the network and inserting his node distorts how nodes are distributed in the graph. Additionally, all clusters that are not connected to the main subcomponent of the network are removed because their closeness centrality is artificially increased because everyone in these clusters appears 'close'; however, they are only close to other individuals in their group because they cannot connect to anyone else in the network. Families like Hrútr's which have fifteen or more children are also removed because the siblings are all close to each other increasing their scores even if they do not have many outside connections (S106).[102]

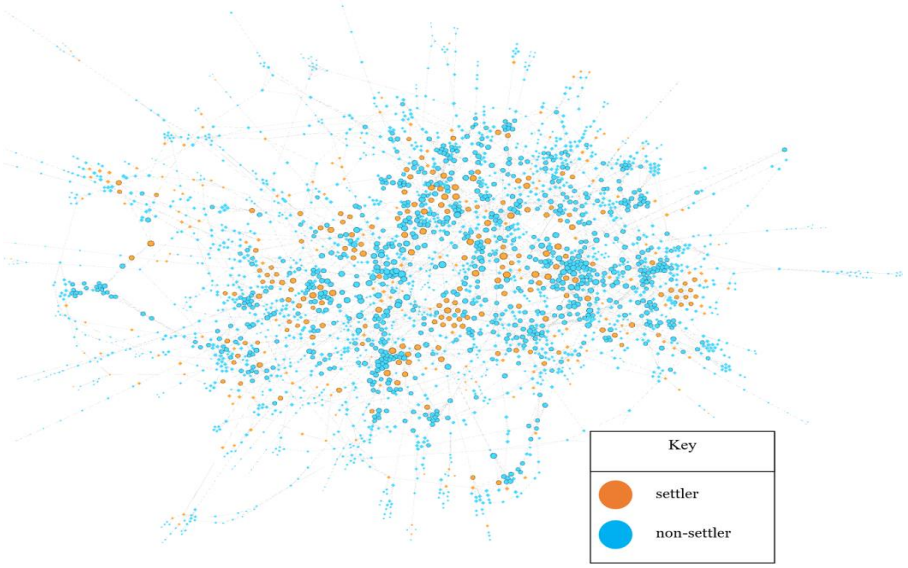


Figure 75 Narrative network resized by closeness centrality

[102] Hrútr is the great-grandson of Auðr *djúpauðga*, therefore, his surplus of children could be an intentional narrative technique emphasising this line's importance.

In Figure 75, the nodes in the middle of the visualisation are bigger than those on the periphery. There is a strong correlation between visual centrality—appearing the middle of the graph—and nodes with high closeness centrality (Golbeck 2013, ch. 3). These are the most central nodes when it comes to being able to reach other individuals in the network and many of these nodes are also orange—settlers. Nodes on the periphery in Figure 75 are typically lower in centrality and have longer edges showing that they further away from other nodes and it is hard for them to get in contact with other nodes in different regions of the network as well as be contacted. However, the size difference between those with the highest and lowest centralities is marginal and there is not much visually discrepancy in the network like with the other centrality measures (see Figures 65 and 70). This indicates that if the narrative network operates similarly to a social network that information would spread quickly within the main subcomponent and that it only takes a few steps for any individual in the network to reach their intended connection. The relative ease of connecting to other individuals in *S* suggests contemporary compilers could manipulate genealogies to trace to a desired ancestor or to make a connection between people that fits their contemporary needs, even if the paths been each node is not the most direct.

5.5.4.b Closeness centrality: quantitative analysis

Looking at the top twenty individuals with the highest closeness centralities in Figure 76, the usual suspects appear. King Haraldr ranks first followed by multiple descendants of Bjǫrn *buna*: Bjǫrn *enn austræni*, Ketill *flatnefr*, Auðr *djúpauðga*, Helgi *bjóla* Þórunn *hyrna*, Ørlygr *enn gamli*, Kjallakr *enn gamli* and their close relations of Ingólfr and Geirmundr *heljarskinn.* Ingimundr *enn gamli* ranks highly again; however, Skalla-Grímr falls out of the top twenty. He still ranks highly overall at thirty-one, but his brother Þórólfr places higher than him at thirteen, even though he is killed before Skalla-Grímr arrives in Iceland. Þórólfr's closeness centrality is likely attributed to his proximities to both Haraldr and Skalla-Grímr, whereas Skalla-Grímr only has relationships with Haraldr via intermediaries.

Top Twenty Individuals with Highest Closeness Centrality					
lnm=landnámsmaðr					
Rank	***Individual***	***Closeness Centrality*** [103]	***Rank***	***Individual***	***Closeness Centrality***
1	Haraldr *enn hárfagri*	0.18917	**11**	Þrándr *mjǫksiglandi lnm*	0.16702
2	Bjǫrn *enn austrœni lnm*	0.18104	**12**	Geirmundr *heljarskinn lnm*	0.16653
3	Ketill *flatnefr*	0.17871	**13**	Þórólfr	0.16651
4	Þórólfr *mostrarskeggi lnm*	0.17415	**14**	Ingólfr *lnm*	0.16641
5	Auðr *djúpauðga lnm*	0.17315	**15**	Kjallakr *enn gamli lnm*	0.16599
6	Helgi *bjóla lnm*	0.17053	**16**	Hallsteinn *Þorskafjarðargoði lnm*	0.16583
7	Þórunn *hyrna*	0.17033	**17**	Hásteinn *lnm*	0.16556
8	Ingimundr *enn gamli lnm*	0.16946	**18**	Hákon *jarl*	0.16549
9	Qrn *í Arnarnesi lnm*	0.16884	**19**	Yngvildr	0.16517
10	Ørlygr *lnm*	0.16884	**20**	Þorsteinn *þorskabítr*	0.16514

Figure 76 Highest ranking individuals in narrative network by closeness centrality

5.5.4.b.i Another important group emerges: Þórsnesingar

Another family group, the *Þórsnesingar* 'the people of Þórsnes', emerges in Figure 76. Three members rank amongst the top twenty: Þórólfr *mostrarskeggi*, Hallsteinn *Þorskafjarðargoði*, and Þorsteinn *þorskabítr*. Their high rankings can be attributed to their geographical and affinal connections with descendants of Auðr *djúpauðga*—which result in their genealogies merging—and Sturla Þórðarson's personal interests in the west of Iceland.

The progenitor of the line, Þórólfr *Mostrarskeggi* has an 'inflated' land-claim narrative which emphasises the sustained political, religious and significance of the land and details how the *Þórnesingagoðorð* 'chieftaincy of Þórsnes' was founded (S85; Long 2017a, 64-8; 2017b, 85-6). According to *S,* Þórólfr lived in Mostr, Norway—and namesake of his byname—before

[103] Rounded to the nearest hundredth-thousandth.

migrating to Iceland because of the *ófríki* ‘oppression’ of King Haraldr. Long (2017b, 107) observes that here the exodus-migration-settlement paradigm is intentionally employed by Sturla Þórðarson to ‘connect the departure of many highborn men (to whom he is related) to the tyranny of the Norwegian king yet explicitly does so in a way that states their conflict with royal authority was justified’. She notes that Sturla is conveniently silent on information available to him in *Eyrbyggja saga* where Þórólfr harbours Bjǫrn Ketilsson, the enemy of Haraldr, thereby drawing the ire of the king (Long 2017a, 65; ÍF IV 5-6). Regardless of why Þórólfr left Norway, he eventually sails into the Breiðafjǫrðr. Here he throws his high-seat pillars engraved with the image of Þórr overboard and proclaims he will settle wherever they wash ashore and dedicate his entire claim to the god.[104] He finds his pillars on a headland, which he names Þórsnes, and he proceeds to claim all the land between the Stafá and Þórsá and establishes his farmstead—later known as Hofstaðir—and a temple. In addition to these locations, he bestows the name of Helgafell ‘holy mountain’ to the topographical feature: Helgafell becomes spiritually significant because it is where Þórólfr and his kinsmen believed they would go when they died, *Þat var trúa þeira Þórólfs frænda, at þeir dœi allir í fjallit.* This ‘ancestor mountain’ narrative also links the spiritual origins of Þórólfr’s kin to Auðr’s (Heide 2022, 32-3).

Like Þórólfr, Auðr worships a mountain, Krosshólar ‘cross hills’, however, she does so in a Christian context, saying prayers and erecting crosses on the hills, *hon hafði bœnahald sitt á Krosshólum; þar lét hon reisa krossa* (S97). Yet her kinsmen revert to a pagan belief system believing that they would be interned in the mountains when they passed …*trúðu þeir því, at þeir dœi í hólana*. These land-claiming and place-naming acts imbue the landscape with ‘social myths’ that not only connect supernatural beliefs to the physical landscape, but also establish territorial power through the ‘transfer, relocation and re-conceptualisation of religious customs, social norms, and legal conventions associated with the mountain’ (Barraclough 2012, 95-97).

[104] See Wellendorf (2010, esp. 4, 7-8, 13) for discussion of Þórólfr’s high-seat scene.

Þórólfr's control over the region was further cemented by founding the first district assembly in the region with approval of all his neighbours (S85). Here the text supports his role as a central figure in the network. However, this original assembly location was desecrated by Þorgrímr, son of Kjallakr, and Ásgeirr *á Eyri*, resulting in a dispute between these men and the Þórnesingar. This fight is a proxy for contemporary legal, political division between the neighbouring farms Bjarnarhöfn and Öndverðareyrr against Helgafell' and is evidence for Sturla's interference even if the resolution of the quarrel is not clear (Callow 2020, 177). Þórðr *gellir*, the great-grandson of Auðr, took charge of reconciling the two groups and then moved the assembly to the new site on the eastern side of the headland with the approval of all who lived in the Quarter. This narrative lays the political and legal groundwork for establishing Þórólfr and the Þórnesingar as the political leaders of the area.

Hallsteinn *Þorskafjarðargoði*, the son of Þórólfr, married Osk, the daughter of Þorsteinn *rauðr,* and their union produced Þorsteinn *surtr*. The other son of Þórólfr was Þorsteinn *þorskabítr* who married Þóra, sister of Þórðr *gellir*, and daughter of Ólafr *feilan* whose son Þorgrímr was the father of Snorri *goði*—who was an important figure for the Sturlungar and features in the dispute over Álptafjǫrðr in the following chapter S86. Essentially 'every descendant of Þórólfr *Mostrarskeggi* could, according to this account [*S*] claim descent from Auðr' (Callow 2020, 177).

Whether intentional or not, the merging of the Þórsnesingar and Sturlungar also creates a connection between Sturla Þórðarson and Ari *fróði*, a descendant of Auðr. Based on their ancestor's connections, Ari's work would have likely been transmitted to Sturla. This would have given Sturla the authority to alter and/or embellish Ari's genealogical frameworks—particularly those in the west—to suit his contemporary needs.

5.5.5. Eigenvector Centrality

Degree centrality only accounts for the total number of edges for each node, it does not consider the importance of each node in the relationship. For example, if X and Y have the same degree centrality, but X is connected to other high degree individuals and Y only has relationships with people with low degree rankings, it is likely that X is more important than Y because they are linked to other well-connected people. Eigenvector centrality measures the influence/transitivity of a node in a network by calculating the importance of its connections—assessing the quality of an individual's relationships not just counting the number of their relationships. The higher the eigenvector centrality of a node, the more influence that node has in the network because it is linked to other powerful nodes. If a node has a low eigenvector centrality, it is not connected to powerful individuals in the network.

5.5.5.a Eigenvector centrality: visual analysis

Figure 77 is the network visualised by eigenvector centrality. King Haraldr and individuals with over ten siblings have been removed to avoid graph distortion. The larger the node is in Figure 77, the higher its eigenvector centrality and the more relationships it has with other well-connected individuals.

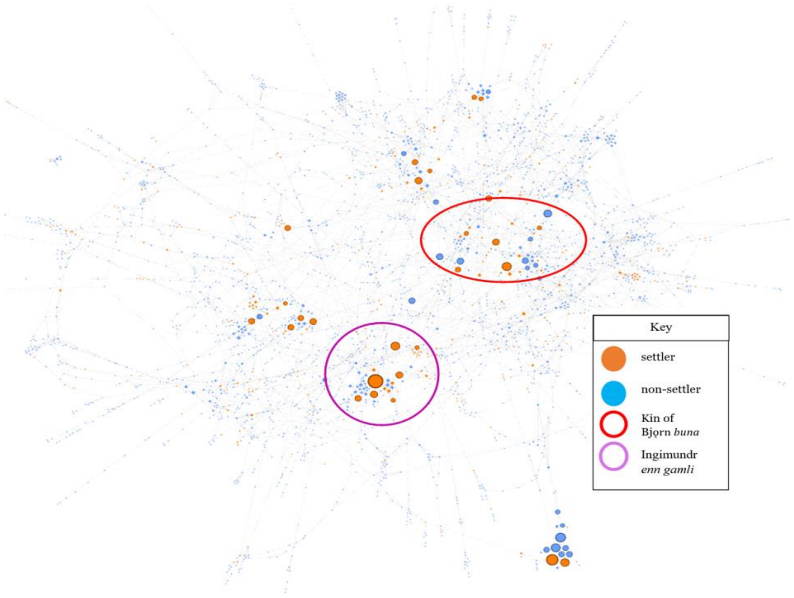


Figure 77 Narrative network resized by eigenvector centrality

Most nodes are barely visible in Figure 77 showing that they have low eigenvector centralities and that they are not connected to important people in the network. Even the nodes of many *landnámsmenn* are small suggesting that they did not solely interact with other important people. This is evidenced in the text where most of the authority granted to *landnámsmenn* is derived from creating dependent settlers who rely on the main settler for social support (see 5.3.1). In this sense, eigenvector centrality might not be the best measure to apply to *S*, because power is not always derived from being attached to other important individuals. It is still worth employing to see if it potentially identifies any individuals who are connected to other important individuals but were previously overlooked or where influential people are interacting in the network.

There are a few small clusters of medium-to-large sized nodes scattered throughout the graph e.g. clusters in red and pink circles. This distribution suggests that power is concentrated in a few individuals/families in the network who each control a different region of the network corresponding to a geographical area. The larger orange nodes surrounded by medium blue nodes in areas of clustering suggest that this power was consolidated early amongst the *landnámsmenn* and maintained by their descendants, establishing lineages with political authority. The socio-political hierarchy would have been stabilised after a few generations following this pattern leading to heightened identities within regional kin groups and eventually these personal ambitions would reach the national stage leading to factional quarrelling like in *Sturlungaöld.* Another interpretation of this pattern is that the original power and importance of the settlers diffused after the first few generations. As their lineages expanded more individuals would be able to claim descent from these proto-elite kin groups, which would spread influence over more individuals. Yet the nature of the text does not frequently describe relationships between non-settlers, therefore, they are less likely to appear to be connected to other important people. The former suggestion is more probable in this case because individuals of later generations mentioned in *S* who have only one or two relationships in the text are more important than centrality measures can detect. Therefore, eigenvector centrality and other centrality measures can help detect

some of the important *landnámsmenn* who established hierarchies in *S* but is not as good at identifying who continued to hold power after the initial settlement phase. This is not a fault of the centrality measures, but a feature of *S* that must be considered when interpreting quantitative results that the textual focus on *landnámsmenn* will privilege them in the rankings over their descendants and non-settlers—even if these people are known to be important historical and literary figures.

5.5.5.a.i Eigenvector centrality: micro-visual analysis

Figure 78 is the cluster of nodes circled in red in Figure 77, the largest nodes in this graph belong to some of the most prominent individuals in the west of Iceland who are often associated with Bjǫrn *buna*: Helgi *enn magri*, Geirmundr *heljarskinn*, Ørylgr *enn gamli*, Bjǫrn *enn austrœni*, and Auðr. There are also a sizeable number of medium-to-large blue nodes who are descendants of these individuals. For instance, Hrútr was a descendant of Bjǫrn *buna* via his mother Þorgerðr. Additionally, through his mother he was half-brother to Hǫskuldr, son of Dala-Kollr. The half-brothers split their inheritance from their mother and for his share Hrútr received part of Kambsnes and then he made his home at Hrútsstaðir in Laxádalr, geographically situating him in the region of his ancestors. His genealogical and land inheritances give Hrútr and his descendants strong claims to the property. This is of particular interest to Sturla Þórðarson because Hrútr via his son Þórhallr is a direct ancestor of Hvamm-Sturla, the grandfather of Sturla Þórðarson (S106). [105]

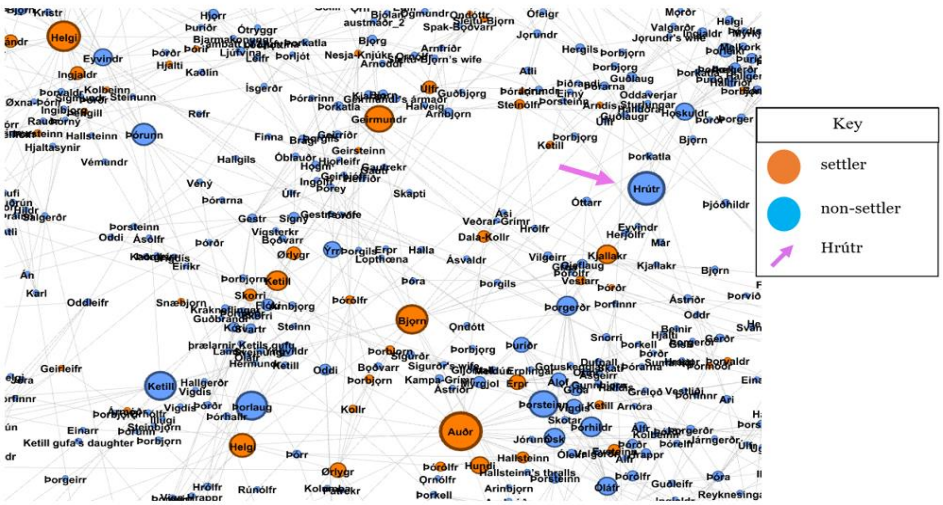


Figure 78 Contents of red circle in Figure 77 magnified

[105] see Sveinbjörn Rafnsson (1974, 181-8) on Sturla Þórðarson tracing his lineage in *S*.

5.5.5.a.ii Eigenvector centrality: micro-visual analysis of Ingimundr *enn gamli*

Figure 79 is an enlarged image of the cluster circled in pink in Figure 77. The nodes in this area are centred around Ingimundr *enn gamli* and other large nodes include Hǫfða-Þórðr, Hrolleifr *enn mikli*, Sæmundr *enn suðreyski*, and Grímr *enn háleyski* who also rank in the top-twenty in eigenvector centrality (see below). But why is this cluster perceived as being as important as the descendants of Bjǫrn *buna* when using eigenvector centrality? It is worth summarising Ingimundr's settlement narrative to analyse how he leverages his relationships to become an authority in the north.

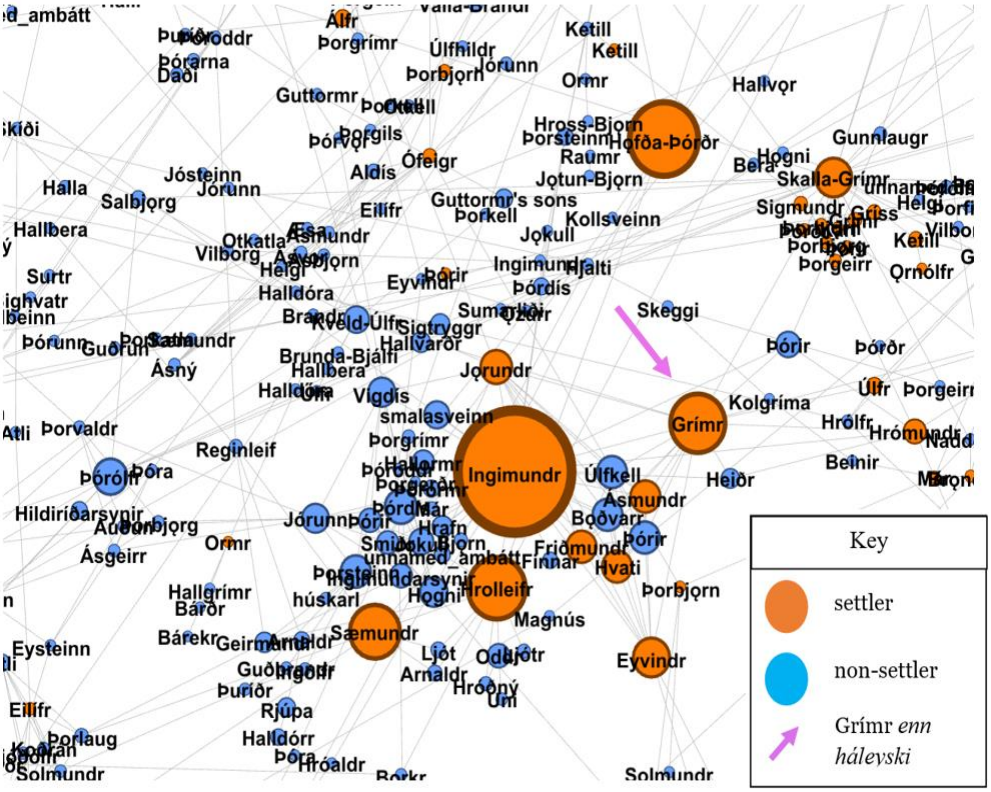


Figure 79 Contents of pink circle in Figure 77 magnified

Before settling in Iceland, Ingimundr went on viking expeditions with Sæmundr *enn suðreyski* in the British Isles; however, their partnership ended when Ingimundr wanted to support King Haraldr at the battle of Hafrsfjǫrðr, but Sæmundr disagreed. After the battle, Ingimundr went to Iceland with King Haraldr's permission, travelling with his brother-in-law, Jǫrundr *háls*; three friends Eyvindr *sørkvir*, Ásmundr, and Hvati; and his enslaved individuals Friðmundr, Bǫðvarr, Þórir, and Úlfkell.

Ingimundr and his retinue spend their first winter in Iceland at Hvanneyrr with his *fóstbróðir* ‘foster-/blood-brother’, Grímr *enn háleyski.* Grímr might be the most important node in Figure 79 because of his position. He bridges the subnetwork centred on Ingimundr in the north with subnetworks in the west like Skalla-Grímr’s. This distribution of nodes indicates there is a separate power centre and tradition in the North of Iceland concentrated around Ingimundr and his connections. This is reinforced by the geographical spread of individuals connected to Ingimindr. Figure 80 shows the farm locations of Ingimundr’s retinue. When looking at an Iceland-wide map, Figure 81, with individuals ranking in top twenty of eigenvector centrality, there is a clear cluster of nodes bounded between Vatnsdalr and Blǫndudalr. This shows that Ingimundr’s subgroup’s influence does not extend to Eyjafjorðr where Helgi *enn magri* is the authority.



Figure 80 Locations of individuals in Ingimundr enn gamli's subgroup

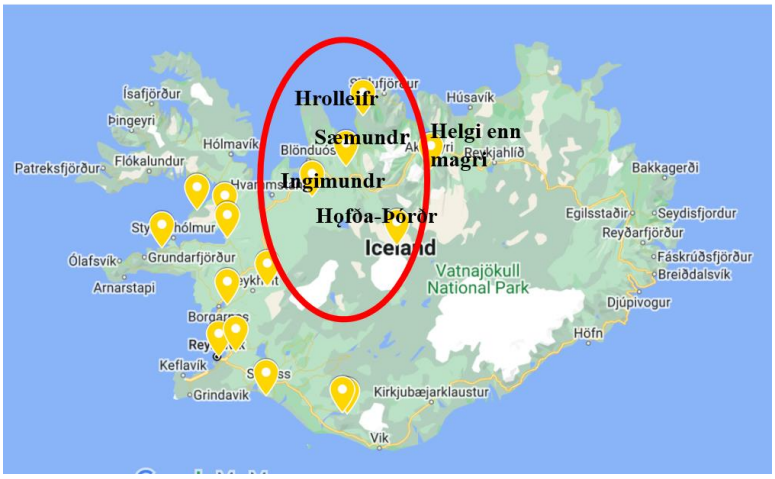


Figure 81 Locations of individuals who rank highest in eigenvector centrality

Returning to Ingimundr's settlement narrative, after settling he maintains his relations with King Haraldr, presenting him with a polar bear, and in return Ingimundr was gifted timber. His settlement narrative ends with his genealogy. Of particular interest, is his daughter, Þórdís who marries Hallormr and as her dowry, they receive Kárnsárlǫnd. Their son, Þórormr became the Kárnsárgoði.

In the next chapter, S180, Hrolleifr and his mother, Ljót migrate to Iceland. They first went to stay with his paternal uncle, Sæmundr *enn suðreyski*, now located in the Skagafjǫrðr However, Hrolleifr was banished from the region because he seduced a woman. Sæmundr sent Hrolleifr to Ingimundr, who set him up at Oddsridge opposite of Hof. However, Hrolleifr got in a dispute with the *Ingimundarsynir* 'sons of Ingimundr'. The Ingimundarsynir are victorious and the chapter closes with the inheritances of each of Ingimundr's being listed.

This prompts the question of why so much narrative space is given to Ingimundr and his family when they ceased having control of the region by *S*'s compilation? The first suggestion is simply that settlement narrative of the region is being committed to the historical and legal record. Ingimundr's settlement is well-known because a version exists in *Vatnsdæla saga* and this source is interpolated throughout *S* (Jesch 1984, 155, 290).[106] More likely, the

[106] *Vatnsdæla saga* concerns the ancestors of the Melamenn, the compilers of *M* and it is the only extant saga used as a source in this redaction (Jesch 1984, 155, 290).

emphasis on Ingimundr, his connections, and this area of northern Iceland is attributed to the socio-political landscape after the *landnám*.

The political disputes and territorial wars between the *hǫfðingjar* in Dalir and Eyjafjǫrðr c.1100-c.1265 cannot be covered in depth at present (see Callow 2020, 44-68 for history of these regions). However, it is worth mentioning that Vatnsdalr and Skagafjǫrðr were political hotbeds where multiple families, especially the Sturlungar and Ásbirningar (a northern-based kin group), engaged in complex relationships in attempts to solidify their power in these region i.e. marital arrangements, conflict between and within kin groups. Therefore, Vatnsdalr and Skagafjǫrðr acted as a geopolitical wedge, driven between the Sturlungar's more stable land-holdings in Dalir and Eyjafjǫrðr. Emphasising Ingimundr's land-claim narrative draws textual attention away from the contemporary secular conflicts and prevents the land-holders in the thirteenth-century from having physical evidence for an uninterrupted history of land-ownership in the area. Even though seven of Ingimundr's children, six legitimate, one illegitimate, are referenced in *S*, their descendants are rarely mentioned. This implies that they either quickly lost influence in the area, or they that they were purposely not included in *S.* It is only Ingimundr's daughter, Jórunn, who married Ásgeirr *at Ásgeirsá*, the son of Auðun *skǫkull*, whose lineage extends far into the Commonwealth period to Bishop Gizurr, and Ormr, chaplain to Bishop Þorlákr (S177).

Notable Ásbirningar are not mentioned in *S*, including Ásbjǫrn Arnórsson, their presumed founder, Kolbeinn Tumason, and Kolbeinn *ungi* Arnórsson, who were contemporaries of the Sturlungar and controlled Skagafjǫrðr closer to the period of compilation. The closest allusion to the Ásbirningar in their proto-ancestor Qndóttr, who bought land from Sleitu-Bjǫrn and lived at Viðvík in Skagafjǫrðr, and his son Spak-Bǫðvarr. Yet, Qndóttr and Spak-Bǫðvarr still live a few generations before Ásbjǫrn (S205, S205n9). This could be evidence for reworking history to present an alternative view on contemporary power dynamics by cutting genealogies short or by not referencing the ancestors of individuals who hold control over a contested region if it did not fit the compiler's interests.

Ultimately, SNA has highlighted that Ingimundr's origin narrative merits a re-evaluation and how the region is depicted in *S* and other *Ldn* redactions should be compared with contemporary sagas to see how secular politics influence the portrayal of Ingimundr in *S*.

5.5.5.b Eigenvector centrality: quantitative analysis

Figure 82 is a table of the top twenty individuals in *S* by eigenvector centrality. The only individual not discussed to this point, but who also ranks highly in other centrality measures is Hásteinn, the son of Jarl Atli of Sogn.

Eigenvector Centrality for Top Twenty Individuals					
ldm=landnámsmaðr					
Rank	***Individual***	***Eigenvector Centrality***[107]	***Rank***	***Individual***	***Eigenvector Centrality***
1	Ingimundr *enn gamli ldm*	1.0	11	Helgi *enn magri ldm*	0.44345
2	Haraldr	0.90378	12	Grímr *enn háleyski ldm*	0.42983
3	Ásgerðr *ldm*	0.77072	13	Bjǫrn *enn austræni ldm*	0.41946
4	Álǫf *elliðaskjǫldr*	0.63935	14	Ingólfr *ldm*	0.41730
5	Auðr *djúpauðga ldm*	0.58505	15	Ketill *flatnefr*	0.41386
6	Þorgeirr *gollnir*	0.57907	16	Sæmundr *enn suðreyski ldm*	0.38577
7	Hǫfða-Þórðr *ldm*	0.56365	17	Ketilbjǫrn *enn gamli ldm*	0.38046
8	Þórólfr *ldn*	0.54333	18	Þorsteinn *rauðr*	0.37759
9	Hrútr *á Kambsnesi*	0.49826	19	Hásteinn *ldm*	0.37726
10	Hrolleifr *enn mikli ldm*	0.45582	20	Geirmundr *heljarskinn ldm*	0.37558

Figure 82 Highest ranking individuals in narrative network by closeness centrality

[107] Rounded to nearest hundredth-thousandth.

Hásteinn and his brothers, Hersteinn and Hólmsteinn, were raiding partners with Ingólfr and Hjǫrleifr, but Hólmsteinn declared that he would either marry Helga, Ingólfr's sister, or not marry at all (S6). This oath caused a dispute between the parties which culminated in the killings of Hólmsteinn and Hersteinn. Ingólfr and Hjǫrleifr had to give Jarl Atli everything they owned which prompted their immigration to Iceland. Hásteinn also had to leave Norway because King Haraldr and Jarl Sigurðr gathered forces against him (S371). On his voyage to Iceland, he threw his benchboards overboard to determine where he should settle, and they washed ashore at Stálfjara off Stokkseyri, but he came in at Hásteinnsund and wrecked his ship, eventually making his home at Stjǫrnusteinar (Wellendorf 2010, 8-9). There is then a discussion of how his inheritance was divided up between his sons, Ǫlvir and Atli.

At first glance, it is unclear why Hásteinn ranks in the top twenty in degree, betweenness, closeness, and eigenvector centrality. He has a royal pedigree and connection to Ingólfr, but he does not have an extensive list of descendants in *S* or is involved in any disputes or stories after he settles. His role in *S* can be attributed to contemporary politics. Hásteinn is the progenitor of the Flóamannagoðorð in Árnesþing which only descends to Þorgils *ørrabeinsstúpr* (948-1009) in *S*, but remains in the family until 1195-1227 when Flosi Bjarnason, an in-law, took over the *goðorð* (Lúðvík Ingvarsson 1987, 234-43; Gunnar Karlsson 2004, 227, 229-30). Between 1227-1238 the *goðorð* (along with Mosfell and Haukdælr) came under the control of Gissur Þorvaldsson, the Sturlungar's chief political rival (Luðvík Ingvarsson 1987, 244-68). By emphasising Hásteinn and his connections with other prominent people, Sturla Þórðarson can likely manipulate memories of the area in favour of his kin. Hásteinn was a distant ancestor of the second wife of Þórðr Sturluson (d. 1237), father of Sturla Þórðarson (S6, S371, S397; ÍF I xxxiv). Although she was not his mother, it would still somehow be to the benefit of his contemporary political interests.

5.5.6 Centrality Conclusion

Applying centrality measures to *S* was an effective endeavour because it detected individuals who are important to the structure of the narrative network. The findings often corroborated the text's statements on who were considered outstanding settlers and chieftains, or more generally identified well-known individuals throughout the ON-I corpus.

If an individual ranks highly in one centrality measure, they probably score highly in another. Individuals like King Haraldr, Auðr *djúpauðga*, Ingólfr, Hásteinn, and Geirmundr *heljarskinn* rank in the top twenty across all four centrality measures. This suggests that a proto-elite kin group largely connected via the shared ancestor of Bjǫrn *buna* is remembered in *S.* The topographical distribution of farms further localises this group. Figure 83 shows that the individuals who rank in the top twenty of any centrality measure are generally based in the north and west—areas Sturla Þórðarson were familiar with. Only a small number of farms are located in the south and the main individual who appears in centrality rankings from the east is Hrollaugr, who is also associated with Sturla (see 5.3.1.c.ii).



Figure 83 individuals who rank in the top twenty of any centrality measure

These patterns open the discussion on whether the most important individuals detected by the centrality rankings reflect who medieval Icelanders collectively viewed as important figures of memory. Or if these individuals are ascribed more importance in the forms of more narrative space and

relationships by Sturla to further his contemporary political gains. The answer is likely somewhere in between and applying SNA in different ways to *S* and other texts in ON-I corpus will further identify members of this proto-elite kin group and help establish how and why they were perceived as important by their contemporary counterparts.

5.6 Phantom Settlers: Individuals Filling the Landscape?

Degree centrality is not only useful in identifying important settlers who have many relationships, but it can also detect *landnámsmenn* who have no connections in *S*. This measure does not determine if a *landnámsmaðr* is 'real' or 'created'; rather it opens the discussion on their historicity by marking them as individual with no relationships. It is simply a tool used to detect which settlers' authenticities should be re-evaluated using traditional historical and literary methods.

If settlers with a degree centrality of zero share characteristics with so-called 'invented' settlers—*landnámsmenn* believed to be invented to populate the landscape—such as:

- short land-claim narratives of only one or two sentences
- having a personal name element that shares an element with a topographical feature in their land-claim
- living in a sparsely populated area

there is a higher probability that these settlers are used as narrative filler (Þórhallur Vilmundarson 1971; Adolf Friðriksson and Orri Vésteinsson 2003, esp. 146-7).[108]

In *S*, nineteen settlers have a degree centrality of zero, meaning that they have no relationships with other people in the narrative network (see 5.5.2). These *landnámsmenn* are labelled as 'phantom settlers' because they exist as figures in the text but have no meaningful interactions with others. On visualisations of the whole narrative network, they appear as independent

[108] Callow (2020, 157) notes that these 'simplistic' narratives make-up only a small subset of the land-claims in *S*, and that land-claim boundaries and kinship relationships are 'meaningful' in their own right.

nodes strongly disconnected from the main subcomponent of the network. This is shown in Figure 84 where two phantom settlers—encircled in the blue oval—are virtually microscopic and situated far from the central subcomponent of the network. When phantom settlers are magnified (blue box in Figure 84) they have no edges and exist as isolated nodes.

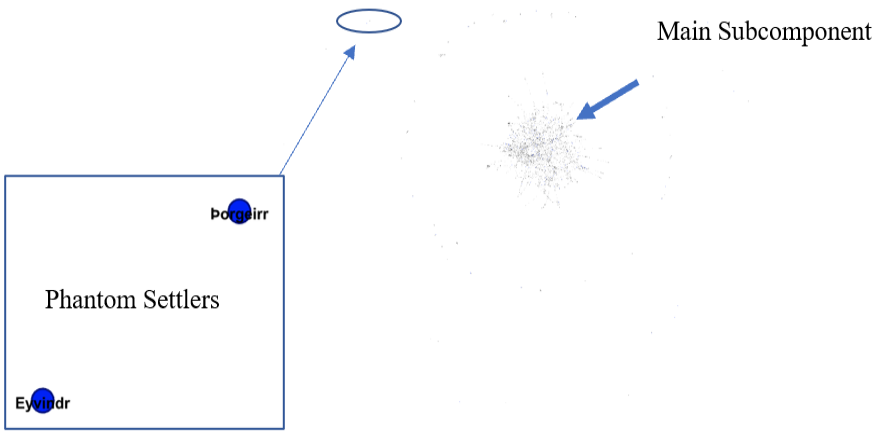


Figure 84 Narrative network of Sturlubók with main subcomponent (right) and location of two phantom settlers circled in network (left), which is magnified in the box

These nineteen phantom settlers, their chapters of reference, and Quarter of residence, are listed in Figure 85 (see 3.3.1). Thirteen of the phantom settlers are associated with place-names that share elements with their personal name or byname. These shared onomastic elements are shown in red in Figure 85. At a cursory glance, this ratio appears to support the 'nature-name' theory popularised by Þórhallur Vilmundarson (1971) in his study on -*staðir* place-names. His assumption was that a place-name was originally derived from topographical features, but these names were later changed in meaning when people misinterpreted them as being derived from a personal name (see also Svavar Sigmundsson 2009a, 268-9). In other words, some settlers in *Ldn* were created based on or to explain the place-name. There is some merit in this approach, however, it is too simplistic to be seen as a catch-all model (Svavar Sigmundsson 2009a, 273).

Table of *landnámsmenn* with a degree centrality of zero				
Settler	**Ch.**	**ON-I**	**Translation**	**Quarter**
Bjǫrn	S303	*Bjǫrn sviðinhorni hét maðr, er nam Álptafjǫrð enn nyrðra inn frá Rauðaskriðum ok Sviðinhornadal.*	There was a man called Bjǫrn *sviðinhorn* 'singe-horn', who took possession of North Álptafjǫrðr west of Rauðaskriðr and Sviðinhornadalr.	East
Sóti	S176	*Sóti hét maðr, er nam Vestrhóp ok bjó under Sótafelli.*	There was a man named Sóti who claimed Vestrhóp and lived under Sótafell	North
Eyvindr	S181	*Eyvindr auðkúla hét maðr; hann nam allan Svínadal ok bjó á Auðkúlustǫðum…*	There was a man called Eyvindr *auðkúla*, who took possession of the whole of Svínadalr and lived at *Auðkúlustaðir*	North
Þorbjǫrn	S182	*Þorbjǫrn kólka hét maðr. Hann name Kólkumýrar ok bjó þar, meðan hann lifði.*	There was a man called Þorbjǫrn *kólka*, who took possession of Kolkumyri and lived there the rest of his life	North
Úlfljótr	S190	*Úlfljótr hét maðr; hann nam Langaholt allt fyrir neðan Sæmundarlæk.*	There was a man called Úlfjótr who took possession of the whole of Langaholt below Sæmundarlœkr	North
Álfgeirr	S192	*Álfgeirr hét maðr, er nam um Álgeirsvǫllu ok upp til Mælifellsár ok bjó Álfgeirsvǫllum.*	There was a man named Álfgeirr who claimed land around Álfgeirsvellir up to Mælifellsá, and lived at Álfgeirsvellir.	North
Þorviðr	S193	*Þorviðr hét maðr, sá er land nam upp frá Mælifellsá til Giljár..*	There was a man called Þorviðr, who claimed land between the *Mælifellsá* and Giljár.	North

Table of *landnámsmenn* with a degree centrality of zero				
Settler	**Ch.**	**ON-I**	**Translation**	**Quarter**
Vékell	S196	*Vékell enn hamrammi hét maðr, er land nam ofan frá Gilá til Mælifellsár ok bjó at Mælifelli.*	There was a man called Vékell the sorcerer/shape-changer, who took possession of land between Gilá and Mælifellsá and lived at Mælifell.	North
Qnundr	S198	*Qnundr víss hét maðr, er land nam upp frá Merkigili, enn eystra dal allt fyrir austan.*	There was a man called Qnundr the Sage, who took possession of land above Merkigil, including the easternmost valley…	North
Þorbrandr	S200	*Þorbrandr ørrek nam upp frá Bólstaðará Silfrastaðahlíð alla ok Norðrárdal allan fyrir norðan ok bjó á Þorbrandsstǫðum…*	Þorbrandr *ørrek* claimed land above Bólstaðará including the whole of Silfrastaðahlíð and the north side of Norðrárdalr and lived at Þorbrandsstaðir…	North
Kollsveinn	S203	*Kollsveinn enn rammi hét maðr, er nam land á milli Þverár ok Gjúfrá ok bjó á Kollsveinsstǫðum upp frá Þverá…*	There was a man called Kollsveinn the strong who took possession of the land between the Þverá and Gljúfrá and made his farm at Kollsveinsstaðir above the Þverá...	North
Gunnólfr	S204	*Gunnólfr hét maðr, er nam land milli Þverár ok Glóðafeykisár ok bjó í Hvammi.*	There was a man called Gunnólfr who took possession of land between the Þverá and the Glóðáfeyisá and lived at Hvamm.	North
Karl	S220	*Karl hét maðr, er nam Strǫnd alla út frá Upsum til Mígandi.* .	There was a man called Karl who took possession of the entire Strǫnd from Upsir to Mígandi	North
Þorgeirr	S240	*Þorgeirr hét maðr, er nam Þorgeirsfjǫrð ok Hv alvatnsfjǫrð.*	A man named Þorgeirr took possession of Þorgeirsfjǫrðr and Hvalvatnsfjǫrðr.	North

Table of *landnámsmenn* with a degree centrality of zero				
Settler	**Ch.**	**ON-I**	**Translation**	**Quarter**
Sveinungr	S260	*Sveinungr nam Sveinungsvík,…*	Sveinungr took possession of Sveinungsvík…	North
Kolli	S260	*en Kolli Kollavík, ok bjó þar hvárr, sem við er kennt síðan.*	and Kolli Kollavík, each living for the rest of his life at the place which bears his name	North
Qrn	S53	*Qrn enn gamli nam Sanddal ok Mjóvadal ok svá Norðrárdal ofan frá Króki til Arnarbœlis ok bjó á Hárekssţoðum.*	Qrn the old took possession of Sanddalr, Mjóvadalr, and Norðrárdalr from Krókr down to Arnarbœli, and lived at Hárekssţaðir	West
Sǫlvi	S74	*Sǫlvi hét maðr, er nam land milli Hellis ok Hraunhafnar. Hann bjó í Brenningi, en síðar á Sǫlvahamri, því at hann þóttisk þar vera gagnsamari.*	A man called Sǫlvi took possession of land between Hellir and Hraunhǫfn. He lived at Brenningr, and later at Sǫlvahamar, because he thought it was better farmland.	West
Kolli	S164	*Kolli hét maðr, er nam Kollafjǫrð ok Skrið-insenni ok bjó undir Felli, meðan hann lifði.*	There was a man called Kolli, who took possession of Kollafjǫrðr and Skriðinsenni, and lived at Fell, for the rest of his life.	West

Figure 85 Table of landnámsmenn with a degree centrality of zero

Some of these phantom settlers are a reflection of folk-etymology—an ancestral settler had been invented to explain the first element of a place-name and thereby reinforce claims to that land, whether it is a reinterpretation of the topographical element as a personal name, or an original personal name given an imagined biography.[109] However, the absence of relationships and shared naming elements between a *landnámsmaðr* and their location does not

[109] This follows what Þórhallur Vilmundarsson (1971) deemed the 'personal-name theory' where Icelandic place-names are derived from personal names and nicknames (if not clearly based on a topographical name). This thesis follows Svavar Sigmundsson (2009a) that neither the 'personal-name' or 'name-nature' theory are completely correct, but they serve as useful models in exploring how places were named.

conclusively designate them as an ‘invented’ settler, and they could have been accurately remembered.

At present the detailed investigation required to establish whether each of the nineteen settlers are constructions of folk etymologies cannot be conducted. But the general geographical distribution of the settlers has examined to see if there are any emerging patterns. Additionally, a cursory analysis of few settlers and their land-claims has been conducted to demonstrate how degree centrality can be used in tandem with onomastics, narratology, and topography when discussing a *landnámsmaðr*’s historicity.

5.6.1 Geographic Distribution of Phantom Settlers

Figure 86 shows the geographical distribution of locations associated with phantom settlers.

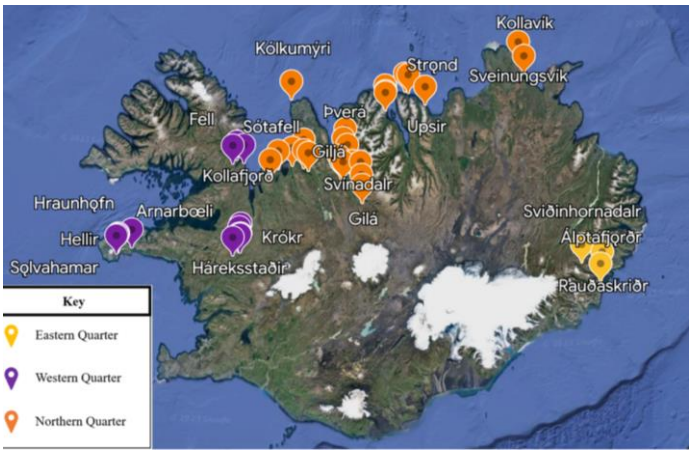


Figure 86 Locations associated with landnámsmenn with a degree centrality of zero

There is a notable absence of phantom settlers in the Southern Quarter. This means that all settlers in the Southern Quarter have at least one relationship in the text. Since all *landnámsmenn* in the South are connected to at least one other individual in the network, it raises the question of if information coming from the South was more complete either in terms of access, amount, and/or quality of sources? If so, it would stand to reason that there would have been less of a need to ‘fill’ the landscape in the South because all habitable areas could be strongly attributed to specific families or individuals. With more information available, it would have been easier for Sturla to manipulate the geographical and textual placement of southern land-

claims to construct a narrative of settlement meeting his contemporary needs. After all, he was comfortable enough with the southern material to split it into two separate sections and rearrange the sequencing of his redaction to put Ingólfr's land-claim first (see 3.2).

Alternatively, this pattern could be a result of how relationships are defined and recorded in the database (see 2.5 and 2.6.3). Some relationship types may be more applicable to certain regions than others; however, to determine whether this is the case, the average number of each type of relationship for all Quarters would need to be computed and analysed. This process is outside of the scope of the present inquiry. Nevertheless, setting the degree centrality at a pre-determined amount in the overarching network, effectively detects superficial trends of recording which provides insight into how information was conceptualised and recorded in different regions of Iceland.

5.6.1.a The phantom settler of the Eastern Quarter

There is only one phantom settler, Bjǫrn *sviðinhorni* associated with the Eastern Quarter. Although Bjǫrn is the only *landnámsmaðr* in the East with no relationships in *S*, there are other settlers from the East who like phantom settlers are disconnected from the main subcomponent of the network. This can be partially attributed to the stylistic difference of chapters in the Eastern Quarter specifically those in Kolskeggr's section, which are characterized by short, terse land-claims and often do not facilitate intratextual relationships (see IV).

For instance, Egill, another settler from the Eastern Quarter, is disconnected from the main subcomponent of the network but has a degree centrality of one. This is because his son Ólafr, the progenitor of the *Nesmenn* 'people of Ness', is mentioned (S292). Therefore Egill is connected to Ólafr, and Ólafr is related to the Nesmenn, but they have no relationships outside of their own lineage and their nodes are not integrated into the main subcomponent of the network. Again, this does not mean that Egill and his son were invented to fill the landscape and in the case of Egill there is intertextual

evidence for his existence because his settlement is also recorded in chapter two of *Droplaugarsona saga* (S292n5; ÍF XI, Dpl 2).

This example demonstrates that degree centrality should be applied in different ways to study settlers in the Eastern Quarter. Instead of being used to find potential 'invented' setters, low degree centralities in this quarter could be employed to detect individuals who merit further investigation in other ON-I sources. This process would help piece together the background of an individual who is included in *S*, but who otherwise has a laconic land-claim narrative.

It is still worth examining the land-claim of Bjǫrn *sviðinhorni*, pictured in Figure 87, to see if he has other qualities, in addition to having a degree centrality of zero, that call his existence into question (S303). The verb *búa* 'have one's own land and household, run a farm, be a householder' is not in his land-claim chapter and he cannot be attached to a specific farm (ONP). His byname *sviðinhorni* 'singe-horn', matches the specific element of the place-name Sviðinhornadalr, 'singe-horn valley', which is a boundary of his claim. This is not a likely place-name qualifier and appears to be only attached to names within this valley e.g. Sviðinhornahraun 'singed-horn lava field'. At some point the valley was renamed Hamardalr 'steep cliff/rock face valley', but the original place-name is recorded in other ON-I sources like *Brennu-Njáls saga*, but Bjǫrn is never associated with any of the locations in his land-claim outside of *S* (S303n9; ÍF XII 134).

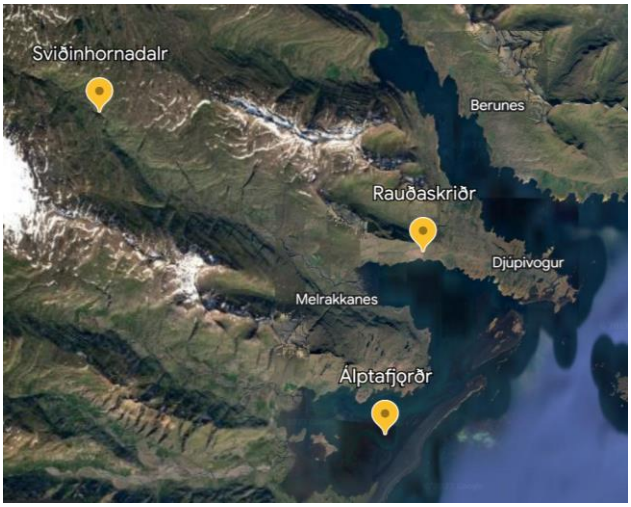


Figure 87 Locations mentioned in Bjǫrn sviðinhorni's land-claim, S303

In this instance, degree centrality correctly identified Bjǫrn as a settler whose historicity could be called into question. He has no relationships in *S*, he has no strong association with a specific farm, his byname shares an element with a place-name boundary, and he does not appear elsewhere in the ON-I corpus. Therefore, the analysis points to him being an 'invented' individual used to fill the landscape.

5.6.1.b Phantom settlers of the Western Quarter

There are three phantom settlers in the Western Quarter, Qrn, Kolli, and Sǫlvi. The locations associated with these men in Figure 88. Qrn farms at Hárekssta̧ðir, Kolli at Fell, and Sǫlvi first at Brenningr and later Sǫlvahamar. From this distribution it is apparent that there is no regional geographical concentration of phantom settlers because they settle in different areas of the Western Quarter. What these three phantom settlers do have in common besides a degree centrality of zero is that their personal name appears to form the specific element of a place-name in their land-claim. However, these place-names do not have clear-cut interpretations.

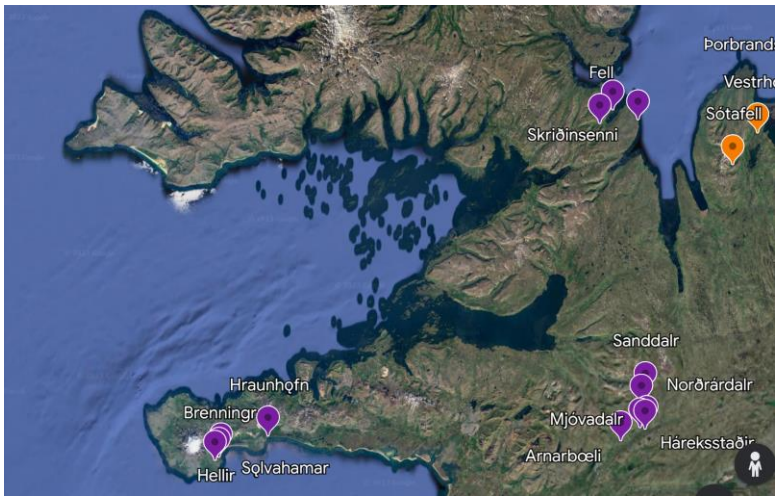


Figure 88 Locations of the phantom settlers of the Western Quarter

Qrn claimed land from Krókr down to Arnarbœli and farmed at Hárekssta̧ðir (S53).[110] Arnarbœli is a difficult place-name to interpret because

[110] Farms are not always named after the person who lived their first particularly with names in *-staðir* and it could be possible that Qrn had a descendant named Hárekr, or another individual with this name farmed here afterwards and the farm was renamed to reflect the new ownership,

the specific element can either be the masculine ON-I personal name *Ǫrn* or the masculine noun *ǫrn* ‘eagle’ with ‘Arnar/arnar’ being the gen. sg. forms of each respectively. The generic element *bœli* also has multiple definitions in one sense it means ‘a den, nest, or eyry’ so one possibility of the place-name could be ‘eagle’s nest’ (ONP). Another interpretation of *bœli* is ‘land that is settled and cultivated, farm’ and be compounded with the personal name *Ǫrn* giving the place-name the interpretation of ‘Ǫrn’s land/farm’ (ibid.). Additionally, the compound *arnar-bœli* is frequently used as a local name for farms in Iceland and could simply be the farm’s name (ibid.). Regardless, of the ‘correct’ interpretation of the place-name, degree centrality successfully identified Ǫrn as a settler’s whose land-claim and historicity needs to be reassessed.

Kolli claimed Kollafjǫrðr before settling at Fell (S164). It could be that his name lent itself to the fjǫrð, but the specific element of Kollafjǫrðr could also be the gen. pl. form of the masc. ON-I noun *kollr* ‘round-topped, with a round top’ which would give the place-name the sense of the ‘the fjord with the rounded mountain tops’. The toponymic interpretation of the place-name is more probable because at the bottom of Kollafjǫrðr stands Klakkur, a prominent mountain with a rounded top, see Figure 89. Of course, one mountain does not explain the gen. pl. form, but it is enough evidence to re-evaluate the meaning of this place-name and if there was actually a Kolli who claimed Kollafjǫrðr because he has no relationships in *S.*



Figure 89 Klakkur (Standir) in Kollafjǫrðr, (Sigurður Atlason via Wikimedia Commons, CC-BY-2.5)

but it is a matter of coincidence which name sticks (Svavar Sigmundsson 2009b, 64). This cannot be assumed because none of Ǫrn’s relatives are known.

Originally, Sǫlvi lived at Brenningr before moving to Sǫlvahamar because he considered this location better for farming (S74). The personal name Sǫlvi does not lend itself to any topographical interpretations, therefore, this could be an original personal name given an imagined biography or genuinely reflect that a man named Sǫlvi lived at this location. *Barðars saga* also places a Sǫlvi at *Sǫlvahamarr*; however, there are many discrepancies between the accounts (S74n4; ÍF XIII 5). In the saga, Sǫlvi's uncle, Barðar, throws him off a cliff and Sǫlvi cracks his head and dies. After his death, the cliff was known as *Sǫlvahamarr* (*-hamar* 'cliff, rock face').

Sǫlvi is remembered at Sǫlvahamar/Sǫlvahamarr in both texts, but in different guises. In one he is a settler, in the other just a child. This demonstrates that each account is its own localised product using Sǫlvi either as landscape filler, or as a stock character who moves the narrative forward, to fulfil its contemporary needs. Yet, both stories develop from the same collective memory of settlement, Sǫlvi—whether he is real or not—must be associated with Sǫlvahamar as a figure of memory. He is the constant in the landscape that biographies can be built on. Although in this instance, it is difficult to say if Sǫlvi was invented, it can be said that different versions of him existed in collective frameworks.

This example illustrates the value of comparing the descriptions of phantom settlers in *S* with their portrayals in other works in the ON-I corpus (if they are attested elsewhere). More exhaustive onomastical and topographical analysis on these individuals and their land-claims would help confirm whether they were invented to fill the landscape or if they were perceived as a historical figure/ancestor. At present, this comparison is outside the scope of this thesis, but the first step in this process, identifying phantom settlers in *S* has been achieved.

5.6.1.c The phantoms settlers of the Northern Quarter: the supernatural Skagafjǫrðr

The region of Iceland with the most phantom settlers is the Northern Quarter with fifteen. In the interest of conciseness, only general patterns will be observed and not all phantom settlers from this Quarter will be discussed.

Looking at Figure 86, there is a high concentration of phantom settlers in Skagafjǫrðr. These locations are magnified in Figure 90. Two of these settlers are explicitly connected to supernatural elements. Vékell's byname is *hamrammi* 'shapeshifter' and Qnundr is a *víss* 'sage' who uses divination to help claim his land. Additionally, both men appear to interact with others in the text, but there is not enough information to establish that they had relationships. Vékell *spurði* 'asks' about a man named Roðrekr's travels, but it is unclear who he is talking to or that he even receives an answer, nevertheless shortly after soliciting this information, he went south in search of land. Qnundr threw a spear to claim his land because through divination he predicted when the main settler in the region, Eiríkr *í Goðdǫlum* would explore the area to look for land. It is evident that Qnundr knew of Eiríkr, but it is ambiguous as to how they are connected.

It could be that Vékell and Qnundr had relationships with others in Skagafjǫrðr which were not recorded or would have been inferred by the intended audience. Additionally, the farms of these men, Mælifell and Merkigil respectively, do not share an element with their personal names or bynames indicating that the place-name is not derived from their settlement narratives. Yet that they only have allusions to connections to other people (often unnamed), in addition to their proclivity for the supernatural still gives the sense that even if these men are not invented, their land-claim narratives have been embellished to provide a folk history of the areas. Therefore, Vékell and Qnundr's historicity is still inconclusive, but using degree centrality to filter data enabled similarities between these individuals to be observed.

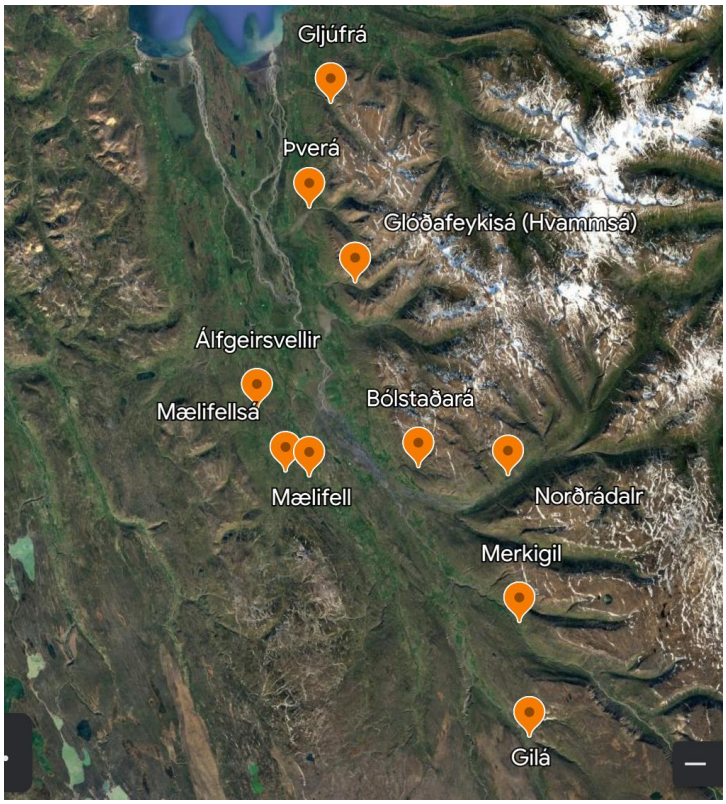


Figure 90 Locations associated with the phantom settlers of Skagafjǫrðr

5.6.2 Phantom Settlers Conclusion

Overall, this preliminary study shows that degree centrality can be applied in a variety of ways to open and add to discussions of the historicity of individuals recorded in *S.* This is attributed to the inherently relational nature of these sources which emulate 'real-world networks' as a feature of the genre (MacCarron and Kenna 2012). More often than not people in *S* who have been considered the most historically important both within the ON-I corpus and in scholarship rank highly in degree centrality; whereas individuals who score low like phantom settlers may be 'created' to fill the landscape. Or if a phantom settler like Sǫlvi is attested in other sources its raises interesting questions on interpolation and collective memory. Degree centrality in combination with other centrality measures is a start in reevaluating the phantom settlers of S—and in the future individuals with low degree centralities elsewhere in the ON-I corpus—because even if they do not connect to others in the narrative network they are still conceptualised as part of the collective settlement narrative.

5.7 Conclusion: A Social Network Analysis of the Landnámsmenn of Sturlubók

Chapter V revealed how different types of land-claiming methods contribute to unequal power dynamics not only between settlers and non-settlers, but also the *landnámsmenn* themselves. In settler-only network graphs (see Figures 54, 57, 59-60), regional hierarchies visually emerge as hub-and-spoke formations with a primary settler functioning as a local hub creating dependants by giving other people approval to settle within their land-claim or gifting land. These hierarchies are initially reinforced by settlers leveraging their pre-existing kinship bonds to migrate to Iceland, overwinter with, and eventually settle near their kinsmen or friends. Yet in the cases where this settlement sequence does not play out, geography almost immediately becomes the main influence of a node's position on the network (see III). More often than not the powerful settlers form alliances with their neighbours through marriage, consolidating lineages and lands in the process.

To discover who the most influential individuals are in the narrative network, centrality measures were employed. Most of the people detected are *landnámsmenn*, related to Bjǫrn *buna*, and are explicitly identified as outstanding settlers in *S*. Yet the individual who often ranks the highest across all measure is a non-Icelander, King Haraldr, who functions as a central figure of memory on which Icelanders can construct a shared past via a mutual connection. Centrality measures are also valuable in identifying not only individuals that are important to the structure of the narrative network, but also those who are not. Analysing settlers who have no relationships (a degree centrality of zero) provides more evidence for so-called 'phantom settlers', who fill the landscape.

To demonstrate how these powerful settlers come together in the narrative network, the next chapter investigates the function of women in the narrative network. Although, there are fewer women recorded in *S* than men, they are equally, if not more important because they bridge together kin groups that would otherwise have no relationships in *S.*

VI Case Study: A Social Network Analysis of the Women of *Sturlubók*

6.1 Absent and Exceptional: Previous Approaches to Gender in Sturlubók Scholarship

Traditional readings and conventional historical and philological approaches have firmly established that men—and their relationships—are remembered more than women in *S* (Clover 1988; Jesch 1991, 2014, 2015; Jacobsen 2005; Callow 2011). Scholarship on women in *S* has taken on characteristics of this imbalance, oscillating between two opposing approaches: absence and exceptionalism. The dual emphasis on unrecorded women and those deemed 'exceptional' like *landnámskóna* 'female settlers' has led to 'ordinary' women—wives, mothers, daughters, and sisters—who comprise most of the female population in *S* being overlooked. To bridge this gap in scholarship between unrecorded women and prominent foundational figures, all women recorded in *S*—not just those deemed important—are visualised and quantified using VA and SNA. This approach adds to our understanding of gender dynamics in ON-I texts by analysing how women function in their multiple roles throughout the narrative networks of *S* with the following questions:

- How do women collectively influence the structure of the narrative network of *S?*
- How do individual women operate in the network?
- Does gender impact the inclusion of someone in the text?
- Are there any 'exceptional' women in *S*?
    - If so, who?
    - If not, why?

6.1.1 Implied Women: On the Underenumeration of Women in Sturlubók

In the first mode, scholars have attempted to explain why there is a scarcity of women in *S.* Clover (1988, 168, 174-6) introduced the concept of 'implied' or 'invisible wives', where the presence of a woman is anticipated in a genealogy, but not realised (see also Jesch 2014, 272). It is common for lineages to enumerate a man and his children, excluding the mother/wife:

> *Álfarinn Válason hafði fyrst numit nesit á milli Beruvíkhrauns ok Ennis. Hans synir váru þeir Hǫskuldr, er bjó at Hǫskuldsám, ok Ingjaldr, er bjó á Ingjaldshváli, en Goti at Gotalœk, en Hólmkell at Forsi við Hólmkelsá*
>
> (S77)

> Álfarinn son of Váli first took possession of the peninsula between Beruvíkrhraun and Enni. His sons were Hǫskuldr who lived at Hǫskuldsá and Ingaldr, who lived at Ingjaldshváll. and Goti at Gotalœk, and Hólmkell at Fors near Hólmkelsá.

The wife of Álfarinn and mother of his children is unrecorded, even though she could have been easily inserted into this genealogy.

This concept can also be applied to daughters and sisters who do not always appear in genealogies when their presence could be expected. Returning to Álfarinn, his lineage only lists sons, and it is possible that these men were his only children. The genealogy could have been curated to exclude daughters and sons that did not sere present social or political purposes. However, attempting to guess if Álfarinn had more children is an impossible task, therefore, I focus only individuals mentioned in *S* (see 2.4.2.a.i). When sons and daughters are enumerated together, the names of brothers are frequently listed before their sisters' suggesting there is a male preference. Additionally, it is typical for brothers to outnumber their sisters in lineages—sometimes at considerable rates. For instance, Hrútr and his wife Hallveig have fifteen sons to only five daughters (S106). [111]

[111] There are exceptions to this rule and sometimes only daughters are listed in a lineage. For example, Halldóra is the only child of Ormr (S351). Also, there are occasions where an

Clover (1988, 168, 176) ultimately argued that these demographics in the text are 'consistent, if impressionistic' of a male-dominated frontier settlement society further imbalanced through the practice of female infanticide. These conclusions rely too heavily on non-Scandinavian sources and scant archaeological finds, and they conflate the socio-historical reality of the *landnám* with the narrative settlement society. Therefore, her overarching findings must be contextualised when applied, but the concept of 'implied' women is useful when discussing the gender imbalance of *S* and how genealogies are crafted.

For each of the first five generations of individuals in *Ldn*, Jacobsen (2005) compared the percentages of recorded men and women. In the first generation of Icelanders, she observed a large disparity in the sex ratio favouring males. As the generations progressed, the sex ratio flattened. She examined how social factors like social, marital, and cultural status impacted the proportion of women recorded per generation in the *landnám*. For example, wives of male settlers who came from Norway were more likely to be mentioned than spouses of men of Norwegian extraction arriving via the British Isles. Based on this evidence and other examples, Jacobsen concluded that women who were of Celtic origin and/or enslaved were more likely to be consciously omitted.[112] Although her findings present a compelling case and demonstrate that origins and social status had an impact on the absence of women in the text, her study is assumes that the text is an accurate sample of the historical population. There is 'no simple correlation between the numbers of women named in these biased sources and numbers of women on the ground' during the settlement of Iceland (Jesch 2015, 102). Particularly when so little of this information is known about those who are recorded (i.e. a person's origins, identity), it difficult to project these percentages onto those who are not documented.[113]

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individual has an equal number of daughters and sons like Ketilbjǫrn *enn gamli* who has four of each with his wife, but he also has an illegitimate son (S385).

[112] Gísli Sigurðsson (1988) and Jónas Kristjánsson (1998) also suspect there is a larger hidden populace of Celtic women and enslaved people who have been underrecorded in texts like *Ldn*.

[113] Just over 10% of individuals have a specific place of origin recorded in *S* (Jesch 2016, 142).

The above studies show that the absence of women in *S* is attributed to a multiplicity of 'real-world' factors such as, but not limited to patriarchal attitudes, female infanticide, inheritance laws, origins, etc. Although some of these causes are more influential than others, attempting to assign values to each and determine which factor is the most important detracts from the women who are mentioned. Therefore, this thesis uses only explicit references of women, and does not attempt to insert those who are 'implied' (see 2.6.1). This approach enables the function of women to be examined through studying their presence, which also sheds light on why another woman might have been left undocumented.

6.1.2 Exceptional Women

Scholarship has also focused on 'exceptional' women like Auðr *djúpauðga* 'the deep-minded' and the *landnámskonur* 'female settlers'.[114] Auðr is identified as one of the *gǫfgastir* 'leading' settlers of the Western Quarter and her land-claim in Breiðafjǫrðr is described at length (S13, esp. S95-S103, esp. S107-S10, S170, S399). This claim has been used as an exemplar to discuss how cultural memory evolved over time, people perceived and named the Icelandic landscape, how Viking Age and religious women were transmitted in literature, etc. (Barraclough 2012, 92; Vanherpen 2013, 2017, 2018, 2020; Bennett 2014, 27-8, 47; Egeler 2019). Therefore, Auðr's role in *S* is not representative of most women function in the text and it would be expected that her function in the narrative network differs from other women. Yet to reduce preconceived biases in the present study, Auðr's 'exceptionality' is not assumed. Her data is prepared and quantified like any other individual in *S* (see 2.3 and 2.6.1). Therefore, if she ranks highly in metrics and appears in prominent positions in visualisations, her 'extraordinary' is confirmed. These elements can then be examined to see if she is unique because she is a woman or if there are other factors contributing to her perceived importance? On the other hand, if she operates like other 'normal' women in the network, what are the repercussions for scholarship?

[114] See Vanherpen (2013, 63) for discussion on the 'classical' images of medieval Icelandic women propagated by previous studies of gender in ON-I literature.

The *landnámskonur* have often been treated as a homogeneous group in *Ldn* simply because they are identified as women claiming or acquiring land. Callow (2011, 9, 25-6) has dispelled this myth by demonstrating that that it is a heterogenous collection of female settlers recorded in *S* (and *H*), therefore, group analysis cannot be automatically applied to these women. For instance, female settlers are only recorded in the Western and Southern Quarters of *S* and are not mentioned in the Northern and Southern Quarter narrative units indicating their presence in the text is not universal. This approach builds on Callow's by examining all women in the text at the individual, relational, and network-wide level instead of automatically treating them as a homogenous group.

The aim of this SNA case study is to investigate how women are distributed and function throughout the network and are related to other individuals—both men and other women. Analysing relational patterns of women in the network provides insight into if their inclusion in *S* was simply because the compiler had access to their information, or whether there are other influences impacting their inclusion in *S* (Jesch 2014, 273).[115]

6.2 Where are Women in the Narrative Network of Sturlubók?

Figure 91 is a visualisation where the nodes of the narrative network are recoloured based on their gender category: women, men, family groups, and non-human entities like gods (see 2.6.1.a). It is visually apparent that men significantly outnumber women, which aligns with the findings of traditional approaches. This imbalance is even more striking in Figure 92 where men comprise almost three quarters of the total population compared to women who make-up under a quarter of the individuals in *S*. Family groups and non-human entities are barely visible in both figures. [116]

[115] Jesch (2014, 270-3) observes that the minimum necessary information for purposes of *Ldn* was the personal name of the land-claimant, the extent of their claim, and that all other information is optional—such as wives and children—, but the nature of the text is 'inclusive' and 'additional', therefore, chapters often exceed these minimum requirements.
[116] Since the numbers for family groups and non-human entities are marginal, they will only be discussed when relevant to analysing the role of women in the network.

It is important to stress that this gender ratio does 'represent any kind of historical reality for the first generations of Norse settlers in Iceland' (Callow 2006; 2011, 12). However, studying this gender imbalance is of interest to see how women were perceived by male compilers in historical texts, and how their relationships were conceptualized and potentially manipulated in the thirteenth century (Callow 2011, 9). However, just calculating *S*'s population by gender is a simplistic measure of importance. The number of times a group or individual is referenced in a text, does not automatically equal to their significance in the narrative network. To better investigate the function and importance of women in the narrative network of *S*, different measures and approaches need to be applied.

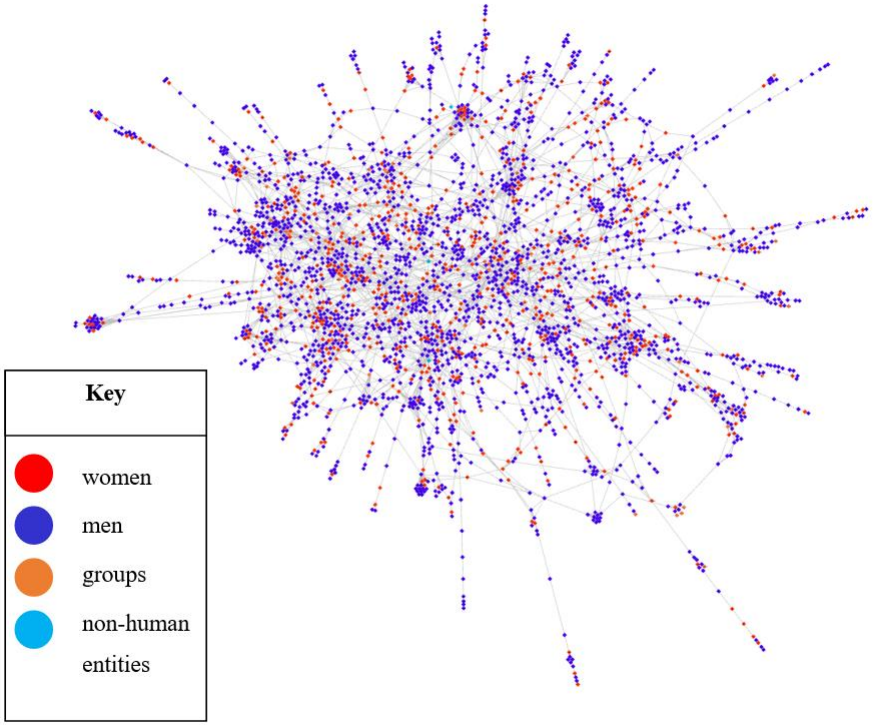


Figure 91 Main subcomponent of the narrative network recoloured by gender

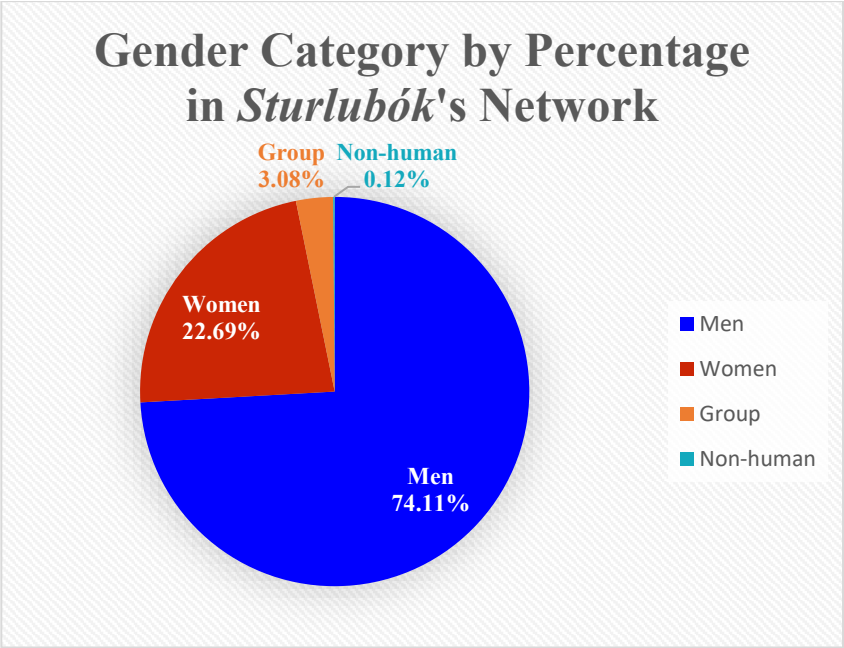


Figure 92 Gender category by percentage in Sturlubók's network

6.2.1 Network Level Distribution of Women

The nodes of women are evenly distributed throughout the narrative network. This can be seen in Figure 93 where the nodes representing women have been enlarged. This distribution indicates that gender does not greatly influence the position of the node in the narrative network. In other words, a woman will not appear in a particular location in the network just because she is a woman. Instead, the position of her node is more heavily influenced by other factors like her geographical location, and the strength and number of relationships, over gender.

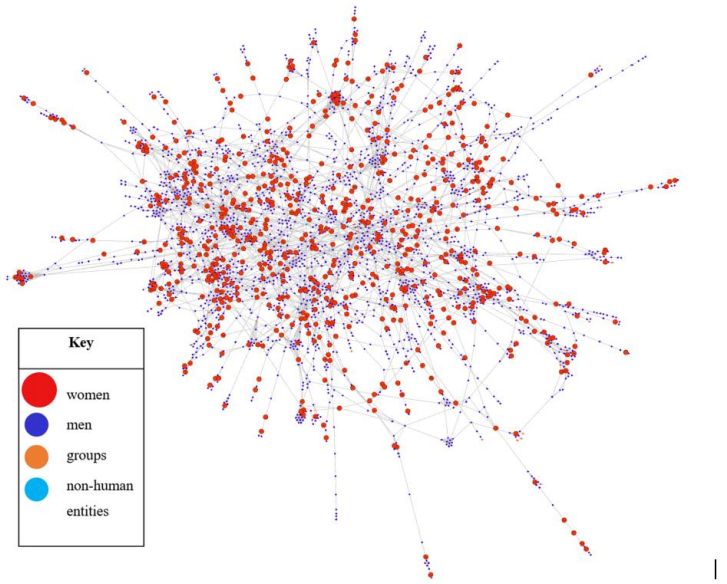


Figure 93 Narrative network recoloured with the nodes of women enlarged

In many relationships, such as marriages, the involvement of a woman is implicit, and roles like wives, mothers, sisters, and daughters are gender-specific, therefore, women must be inserted in certain areas of the network for the society to work. However, although marriages require a woman to make structural sense, they are arranged via geo-political manoeuvrings and these circumstances dictate what specific woman will be slotted into the role. So, although 'wife' is a gender-specific category, not every woman can be inserted into the same affinal relationship because the marriage will lose its original political, social, or geographical function. Thus, gender helps to describe and contextualise relationships in the network and is a required category for certain types of relationships, but it is secondary element when taking into consideration an individual's inclusion in *S*.

The pattern of distribution in Figure 93 also indicates that clusters and subnetworks were not formed based on gender. Many areas of Figure 93 are male-dominated, but they are not exclusively male. If gender contributed to the formation of sub-communities, large clusters of comprised of only red or blue nodes would visualise in the overarching network. Instead, single-gender clusters are virtually non-existent in Figure 93 and when they do appear, they are only comprised of a small number of people. This shows that the network is disassortative based on gender meaning that men and women are more likely to form a connection with each other than with an individual of the same gender

(see 6.3.2; see also Van Deusen 2014). This outcome is likely attributed to the genealogical nature of the text, which encourages marital connections that are inherently heterogenous and often result in mother-son and father-daughter pairings.

This disassortative element is more prescriptive when it comes to women because for a woman to be included in the network, she must be related to, or have some form of connection with a man (see 6.3.2). Independent relationships between women—that is no males influencing their connection rarely occur in the network, and if they do they are often a result of the purposely tracing through a line of female relatives in a genealogy to reach a desired male descendant (see 6.6.1).

On the other hand, men do not necessarily have to be associated with a woman to be included in the network (see 6.3.1). This is attributed to the text's preference to include paternal lines and agnatic lineages that often visualise as long, strings of blue nodes; however, these patterns are not considered clusters because they are not interconnected groups. Additionally, men engage in a wider range of relationships with other men in *S* such as disputes, land transactions, *etc*, that are not usually open to woman-woman pairings. When a woman does engage in a non-consanguineous relationship, it is often with a man, not another woman.

Although, women often make use of different types of relationships than their male counterparts, they still can partake in any type of non-gendered relationships, which is evidenced by women claiming land, migrating to Iceland, and occasionally getting into a dispute. This indicates that women may have less power over all in the network, but they are not viewed as separate entities to men. Women are fully integrated into the settlement society depicted in the text and this is demonstrated by their wide distribution in the narrative network. Therefore, their relationships like men can be manipulated in genealogies to shift contemporary perceptions (see 6.6.1.b).

6.2.1.a Does gender matter?

The distribution of gender and lack of same-gender subcommunities in Figure 93 raises the question if gender functioned as a significant mental and organising category in *S*? It is worth quoting Callow (2011)'s conclusions at length on female settlers in *S* who could inhabit similar roles of men:

> To this extent gender did not always matter to the writers of *Landnámabók* and presumably to their informants. This text could just as easily have contained stories *only* about male settlers, both as leading figures in the *landnám* and as dependents—there was such a wealth of place-name evidence and associated origin myths that the text could have excluded women entirely or else emphasized them far more. That is the text does not exclude women suggests that gender did not matter as a mental category as much as has sometimes been suggested.
>
> (Callow, 2011, 26)

Preserving this historical position of being a *landnámsmaðr* alongside an individual's claim was more important to the compilers than the gender of the individual claiming a property—though there is a patriarchal preference. Everything else besides the settler and their property could be considered optional information. This is supported by geographical organisation of the social network which mirrors the construction of the text and is not organised based on gender. But if a category is perceived as 'optional' it also implicitly suggests that non-settling women and men were purposely included (see 6.4.4). Therefore, it is worth exploring how women function in the narrative network to see if they were added to *S* because there was enough historical or literary information to include them, or if they were consciously inserted to fulfil a contemporary purpose.

6.3 The Function of Women in the Narrative Network of Sturlubók

6.3.1 A Network of Men

To investigate the function of women in the narrative network, the way in which the network is structured without their influence must be examined. Figure 94 is a visualisation of the narrative network where all women are

removed and only men and male-male relationships are shown. Without women, the network becomes less dense and are more fragmented and structural gaps appear between smaller clusters of men. Men, who were connected to the network via a woman, have become detached from the main subcomponent and appear as a disconnected component on the periphery of Figure 94. This arrangement of nodes suggests that women function in the network as bridges. Bridges are edges who removal increases the number of components-weakly connected subnetworks—in the network (de Nooy et al. 2005, 318; see 6.5).

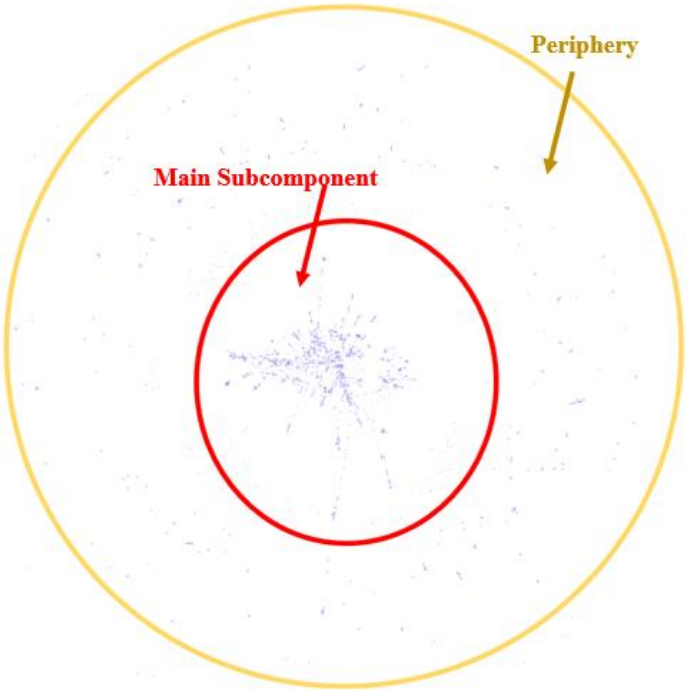


Figure 94 Visualisation of the narrative network with nodes of women removed

However, without women the network does not entirely dissipate, and a central subcomponent remains that is shown in Figure 95. Here there are several small groups of men who cluster around a prominent individual like Ingólfr, Ingimundr *enn gamli*, or Skalla-Grímr—their cluster is identified by the orange oval.[117] The layout of Figures 94 and 95 suggest that although influential, gender does not solely dictate whether an individual is recorded. A

[117] In network graphs where only settlers are visualised, Auðr functions as a hub so this is not a male-only pattern Figure 60.

network can exist without women, but it is not as well-connected and operates less like a small-world network, a network where most nodes can reach each other with a small number of paths (see 6.4.1). This supports the idea all information besides the name of the settler (which is embedded with gender) and the boundaries of their land-claim could have been considered supplementary like personal narratives and relationships (Callow 2011; Jesch 2014). In turn, this indicates that individuals who are identified as non-settlers were included to fulfil social, geographical, or political purposes in the present. Being male enhances an individual's chances of being mentioned in *S* because it is patriarchal-leaning society, but gender is a secondary factor compared to land ownership and political power. This observation combined with the fact that women are not excluded from being settlers suggests that categories of female and male are below the status of *landnámsmaðr*, which is fundamentally intertwined with geography, the main organising agent of the text (see 3.4).

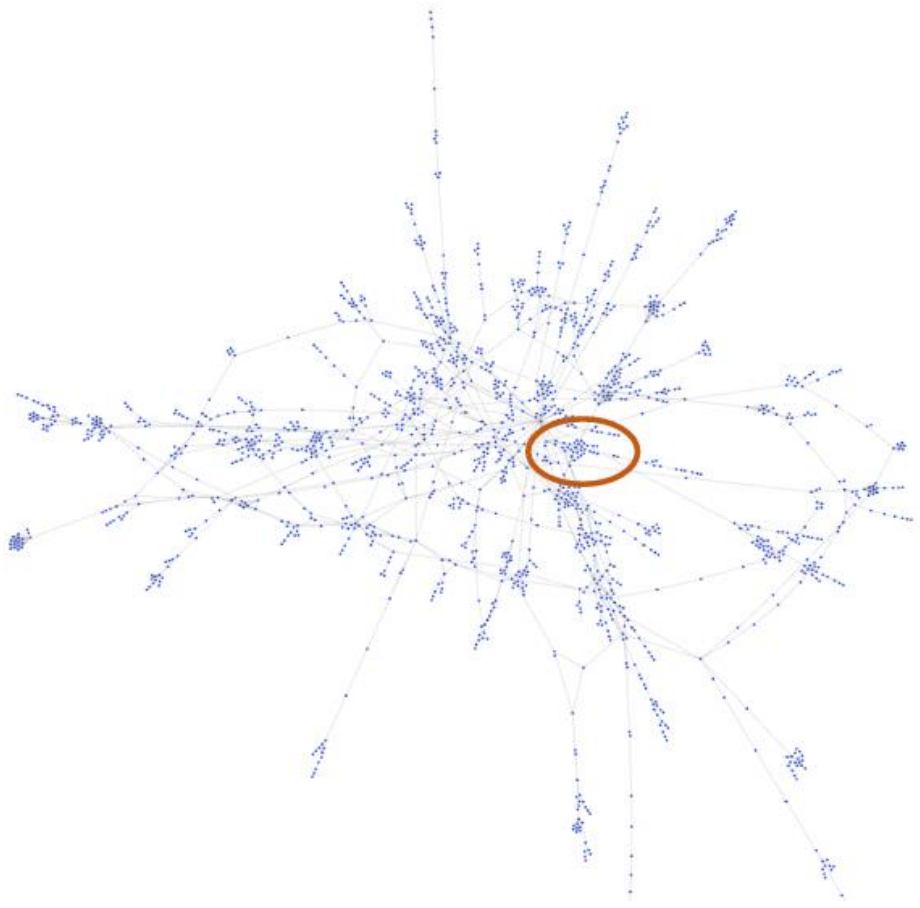


Figure 95 Magnified subcomponent of male-only network (Figure 94)

The magnetic pull a settler has in the network on other nodes can be seen in Figure 96, a magnified view of the orange oval in Figure 95. Skalla-Grímr's node acts as a hub that has many relationships radiating from his node. This pattern mirrors the hub-and-spoke formations that appear in settler-only networks in 5.3.1.c.ii and 5.3.1.c.iii. This is unsurprising because Skalla-Grímr is the most prominent settler in Borgarfjǫrðr who created hierarchical relationships by giving of approval to others to settle in his claim and by gifting way some of his land (see 5.3.1.c.iii; S29-S67). When women are removed from the network, he is not at risk of being disconnected from the main subcomponent because he has initiated many different types of relationships with many different people. This allows him to be able to withstand the deletion of women.

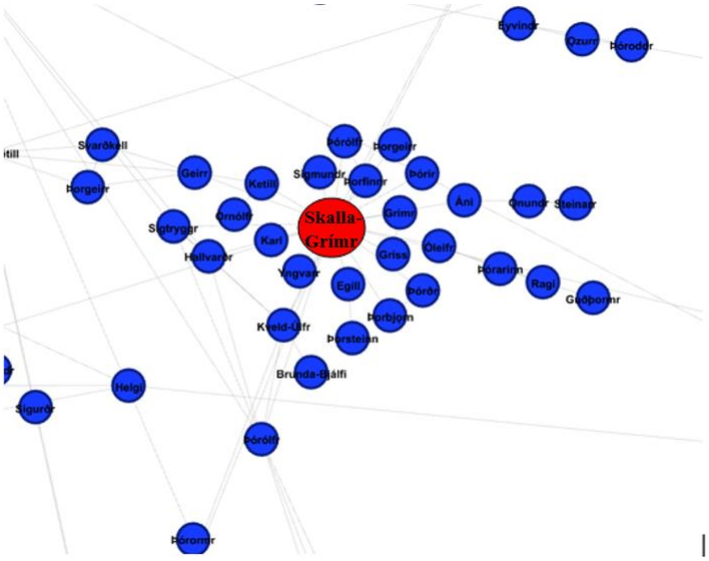


Figure 96 Male-only cluster from Figure 95 where individuals congregate around a prominent settler

Skalla-Grímr's masculinity facilitates the creation of these relationships because men in *S* have a wider variety of homosocial bonds they can engage in; however, geographical, political, and social factors are the main driving force in nurturing these relationships not gender. This is further evidenced by four women, Arnbjǫrg, Þórunn, Þuríðr, and Þorbjǫrg settling in Skalla-Grímr's *landnám* (S41, S61; Callow 2011, 23). It is unclear if Arnbjǫrg, Þórunn, Þuríðr, had direct interactions with Skalla-Grímr, or if he influenced their land-claim, nevertheless, they hold an equal status to the men who settled in his claim

according to *S*. Þorbjǫrg was clearly given land by Skalla-Grímr and this transaction was completed in the same manner as her brothers, Þórir *þurs* and Þorgeirr *jarðlang*. In both instances, the land acquisition supersedes the settlers' gender identity. This is not to say that Arnbjǫrg, Þórunn, Þuríðr, and Þorbjǫrg held equal rights and had the same access to opportunities than their male counterparts, but gender is taken out of the equation when orchestrating these land-based relationships.

6.3.2 A Network of Women?

When men are removed from the narrative network, the structure of the sociogram collapses. This is shown in Figure 97 where only the relationships between the 706 women referenced in *S* are visualised. No large, central subcomponent is visible, and women are scattered across the graph often appearing as isolated nodes. There are some small clusters of women which take on either a linear formation like the cluster circled in gold in Figure 97 or compact diamond- and pentagon-like arrangements of nodes which are circled in purple. Hybrids of these combinations identified by the light blue oval in Figure 97. There is only one cluster which operates differently that other women-only clusters which is encased by the royal blue oval and part of its irregularity is attributed to Auðr's role as a prominent settler. These clusters will be discussed in more detail below.

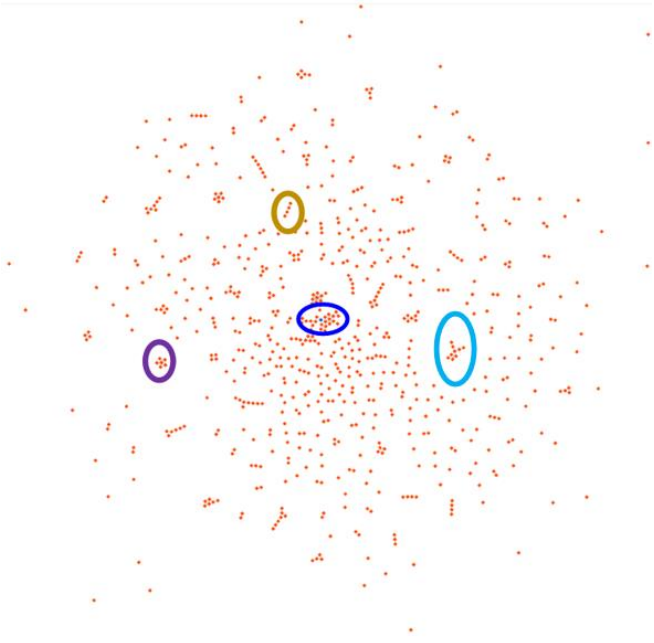


Figure 97 Narrative network with only women visualised

The scarcity of female-female relationships indicates that to be integrated in the overarching narrative network they must be associated with a man: a marriage, father-daughter relationship, etc. It is expected that women were less well-connected than men because they made up a smaller percentage of the population, but for them to not form any large clusters on Figure 97 raises suspicions as to why so few female-female relationships (485 edges, 5.97% of total relationships) are recorded in the text when there surely had been more in the 'real-world'?

A closer look at the distribution and clustering of women in Figures 98, 99, and 100, show that women in *S* only interact with women from their consanguineal kin group. Textual analysis of same-gender female relationships support this initial visual observation. Even in cases where two women have multiple interactions between each other, their familial bond is the foundational relationship which supplemental relationships build upon. For example, Þórunn and Þúríðr *spákona* are identified as neighbours because their land-claim boundaries meet, *Þórunn hét kona, er bjó í Þórunnarholti; hon átti land ofan til Víðlækjar ok upp til móts við Þuríðr spákonu, systur sína, er bjó í Grǫf* 'A woman called Þórunn lived at Þórunnarholt; she owned land down to Víðlækjar and up to the border of Þuríðr *spákona*, her sister, who lived at Grǫf' (S49). The relational identifier, *systur sina* 'her sister' is inserted to emphasise their familial connection and contextualises why these two women claimed neighbouring farms. Mentioning this consanguineal relationship also helps establish a timeline of settlement. Even though, it cannot be determined how long these women have been sisters—or even how they felt about one another—this relationship pre-dates their new roles as neighbours. Furthermore, migrating to Iceland might have changed the dynamics of Þórunn's and Þúríðr's relationship, but the familial relationship itself is immutable, they cannot cease being sisters, but if one moved to a new location, they would no longer be neighbours.

6.3.2.a Woman-Woman Relationships

If a woman is related to another woman in *S*, it is usually via a mother-daughter dyad. These appear in linear formations in network graphs and take on

hierarchical structures like in the gold circle in Figure 97 which is enlarged in Figure 98. Here the linear form is representative of a string of mother-daughter relationships where Vigdís is the mother of Hallgerðr, who is the mother of Vigdís, who is in turn the mother of Þórunn (S128).

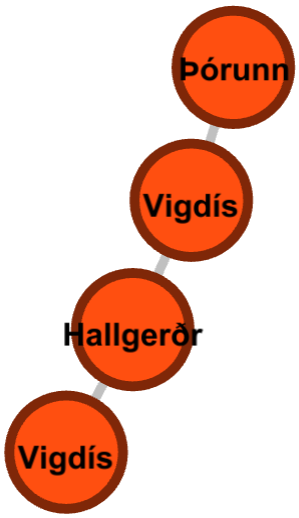


Figure 98 Linear formation of female-female relationships

The pentagon- and diamond-like clusters e.g. Figure 99 are comprised of mother-daughter and sister-sister relationships. For example, Hallveig is the mother of five daughters: Rjúpa, Finna, Ástriðr, Steinunn, and Bergþóra (S106). Any of these women could be at the centre of this cluster because they share the same mother-daughter and sister-sister relationships—there is no indication if one pair of sisters had a stronger connection.



Figure 99 Pentagon-like formation of female-female relationships

Other clusters in Figure 97 are hybrids of linear and diamond/pentagon-formations based on different combinations of mother-daughter and sister-sister relationships. For example, in Figure 100, Úlfrún is the mother of Vilborg, who is the mother of Helga, who is the mother of Þorkatla, Oddleif, Þorgerðr, and Þuriðr (S195, S307, S385). The cluster starts off by following a linear formation and then clumps together towards the bottom because of the addition of sister-sister relationships. Helga is also the sister to Þuríðr, who is the mother of Gunnhildr, which is why there is a small linear connection. Even though evidence strongly suggests that Þuríðr and Vilborg were mother and daughter, this relationship is never explicitly mentioned and these women are never referenced in the same chapter so based on this thesis' methodology they are not connected in the database (see 6.6.1). The lack of references between Þuríðr and Vilborg could mean that Þuríðr and Helga had different mothers, that Vilborg had a stronger connection with Helga, or that the relationship was implied or well-known and did not need to be recorded, etc. There is not enough information to provide a solid answer in this case, but it raises questions about whether the absence of certain linkages between women is intentional or a byproduct of preferring to record men. This question is outside the scope of the thesis at present, but in the future every woman-woman relationship could be investigated with to see if general patterns emerge.

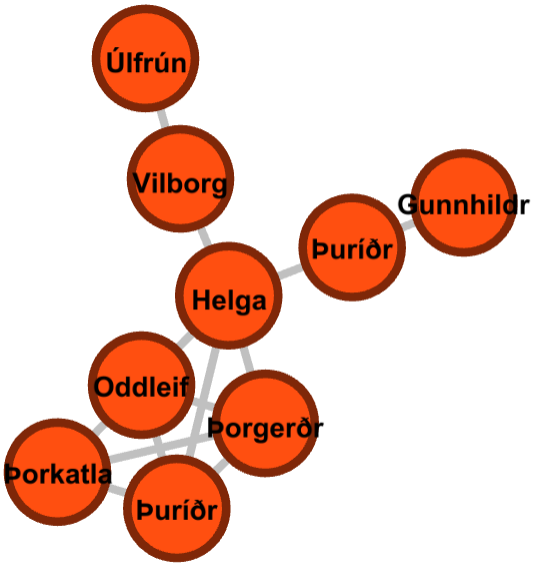


Figure 100 Hybrid formation comprised of linear and pentagon-like female-female relationships

There is one women-only cluster that functions differently from the linear, pentagon-like, and hybrid patterns and it is circled in blue in Figure 97. The irregularity of this group can be attributed to the influence of Auðr *djúpauðа*. The left-side image in Figure 101 is a visualisation of the cluster radiating around Auðr. The right-side image is the cluster visualised to show only Auðr's direct relationships. Auðr's relationships with other women are almost exclusively with women from her kin group. At first glance, this aligns with the general trends of clusters forming as a combination of mother-daughter and sister-sister relationships. However, only two of Auðr's relationships with women fall under these categories. One with Yngildr, her mother, and the other with her sister, Þórunn *hyrna* (S13). Her other relationships with her female kin are not as straightforward.

Although, Álǫf, Ósk, Þórhildr, Gróa, and Vigdís are Auðr's granddaughters, their visualised relationships do not correspond to this bond. Grandparents are not linked to their grandchildren—unless they are explicitly referred by this label (see 2.4.2.a.iv).[118] Instead of functioning merely as a grandmother to these women, Auðr acts as a power-broker arranging their marriages throughout the North Sea region and travelling with some to Iceland (S95, S97, S107-S108). However, she can only embody this position because there are underlining consanguineal bonds.

The only non-kinship-based relationship Auðr has with another woman is with Myrgiol, which is discussed below (S96). In this sense, Auðr is not unlike other women because she predominantly interacts with women from her kin group. What makes her 'exceptional' is that she actively leverages these familial relationships, whereas most mother-daughter and sister-sister dyads passively connect individuals throughout the network. Obviously, same-gender female relationships would have played a more active role in 'real-world' settlement society than is presented, but these socio-political contributions are

[118] This explains why Þorgerðr, another daughter of Þorsteinn *rauði* is not a direct relationship to Auðr in the right-side of Figure 101 because unlike her sisters her marriage is not orchestrated by Auðr (S105).

underrepresented or not recorded in *S.* Auðr is able to engage in non-typical female-female relationships in the text because she operates within a particular set of circumstances. Her land-claim narrative is emphasised, she is descended from a prominent family whose genealogies are highlighted, and her husband, Ólafr *hvíti*, and son, Þorsteinn *rauði*—her granddaughters' father— both die which thrusts her into the roles of 'empowered widow' and the head of the family (Jochens 1995, 61-4; Vanherpen 2017, 571-3). Her situation combined with her status as one of the most prominent settlers of Iceland enables her to act as the 'founding foremother' and arrange marriages. Yet her relationships and interactions with women are not incongruent with the whole of settlement society in *S.*

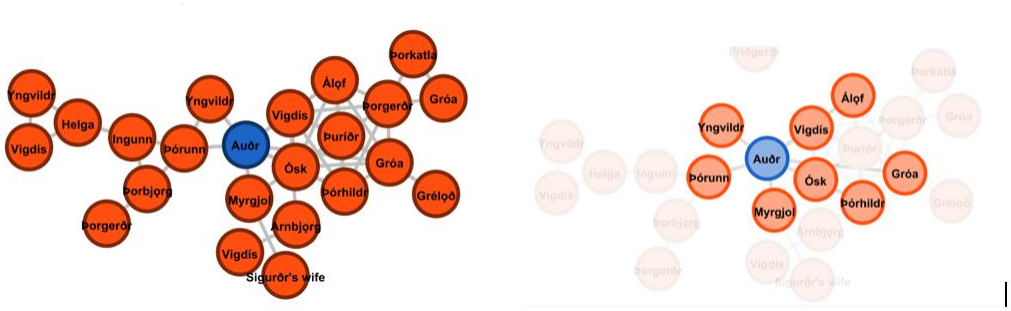


Figure 101 Visualisation of largest female-only cluster (left), Auðr's direct relationships with other women in Sturlubók

Auðr's dealings with women operate within confines of the socio-political structure of settlement period Iceland presented in *S.* She has access to different opportunities which are typically only available to men, but she does not create new types of interactions in the network or change how relationships work because she is a woman. Meulengracht Sørensen (1983, 22) goes as far to state that 'she has taken over the conduct and social functions of the male householder and leader'. Vanherpen (2017, 579) takes a more measured approach saying that Sturla Þórðarson conceptualised 'Auðr as a marginal character—a woman betwixt and between the limited roles assigned to women in the narrative of migration to and settlement in Iceland'. So, although her settlement origins may be unique, her relationships do not deviate from established norms. This is not to say her situation is not rare for a woman or that she could have been seen as a beneficiary or technicality of the existing

system, but she does not supersede it (Clover 1993).[119] Although her womanhood makes her distinctive—feminine pronouns are still used and she is not identified as a 'male' in the text— it is not the main contributor to her 'exceptionality' which is based on her status as a prominent settler. This is an important distinction because if she and other women were considered exceptions and not full-fledged *landmámsmenn*, their descendants may not be perceived as legitimate owners of land-claim in the present. The bilateral kinship system and ability for women to claim land in *S* demonstrates that even though it was uncommon, women could perform most of the same actions in the network as men—excluding inherently gendered relationships, e.g. father, son—if they were required and legally able to do so.

6.3.2.b Non-consanguineous kinship relationships between women

There are only two sequences in *S* where female-female relationships are not based on kinship. In these instances, the bonds between women are established through enslavement, where the woman in power imposes her will on the woman in servitude. These female-female ties are atypical because they progress the land-claim narratives of the prominent settlers Auðr *djúpauðga*, and Geirmundr and Hámundr *heljarskinn*.

Myrgjol was the *ambátt* 'bondswoman' for the unnamed wife of Jarl Sigurðr. She was later purchased and was promised freedom by Auðr if she faithfully served Þuríðr, Auðr's granddaughter. Then Myrgjol and her son, Erpr, travelled to Iceland with Auðr (S96). Although Myrgjol's manumission is never mentioned, it appears that Auðr lived up to her promise, freeing Erpr and granting him Sauðafellslǫnd (S103). Erpr then becomes the progenitor of the Erplingar line. But why insert Myrgjol in *S* and attach her to Auðr's *landnám* narrative?

Myrgjol's inclusion in *S* strengthens both Erpr's personal genealogy and increases Auðr's status. Erpr already could claim descent from the 'Gaelic elite' in *S* via his father Jarl Meldún *af Skotland* 'of Scotland' (Etchingham et

[119] Clover (1993, 387) questions whether 'femaleness' could be overridden by other legal, social, and familial factors, She ultimately concludes that 'sexual difference used to be less a wall than a permeable membrane' in ON-I society.

al. 2019, 320). Inserting Myrgjol increases the 'Gaelicness' and royal connections in his lineage. Although Erpr's personal name is clearly Norse, both of his parent's names are markedly Gaelic and his mother is stated to be the daughter of Gljómall *Írakonungr* 'a king of the Irish' (Hermann Pálsson 1961, 67-9; Etchingham et al. 2019, 306). Even though Erpr is descended from royalty on both sides, his status in Iceland is perceived to be lower than Auðr's which is attributed to how she establishes an unequal power dynamic through their relationships.

It would have been important for Auðr to establish herself as a more powerful individual than Myrgjol and Erpr because of her family's past dealings with the 'Gaelic elite'. Auðr's husband Óleifr *enn hvíti* was formerly the ruler of Dublin and was eventually killed fighting in Ireland, causing her to flee to the Hebrides. Her son, Þorsteinn *rauði*, established himself as a *herkonungr* 'warrior king' in the Hebrides and conquered Caithness, Sutherland, Ross, and Moray, but he was betrayed by the Scots (*Skotar*) and fell in battle prompting her to migrate to Iceland (S95). From the text it is unclear if Erpr or Myrgjol's families contributed to Auðr's ousting from Ireland and the Hebrides; however, if they did their lineage could have been perceived as stronger and more fit to rule. Recording Erpr or Myrgjol as enslaved individuals under her ownership establishes her and her descendants' dominance over the Erplingar, which is further solidified through their manumission and gifting of land. These relationships effectively flip the narrative, with Auðr asserting her control over the Gaelic elite in Iceland, instead of the focus remaining on why she had to leave Ireland and the Hebrides.

The other instance of a non-consanguineous female-female relationship is in S112, where King Hjǫrr raided in *Bjarmaland* 'Permia' and took Ljúvína, daughter of the unnamed king of Bjarmaland, back to Rogaland in Norway. She had two sons with the king, Geirmundr and Hámundr. But because they were *svartir mjǫk* 'swarthy' she exchanged her sons with Leifr, her unnamed *ambátt*'s 'bondswoman' child. After the exchange, Ljúvína claimed Leifr as her own because of his fair skin. When the king was away on an expedition, Ljúvína had the poet Bragi visit and examine all the boys. He identified the

true sons of the king, Geirmundr and Hámundr, not Leifr, and called them *heljarskinn* 'hell-skins'. Here the *ambátt* functions as a narrative device, inserted as a vessel to produce Leifr, whose complexion juxtaposes Geirmundr and Hámundr's. Her inclusion in *S* is not mandatory because this origin story occurs prior to the brothers emigrating to Iceland. Additionally, the parallel *landnám* narrative in M30 does not mention Ljúvína, the *ambátt*, or Leifr. Instead Geirmundr and Hámundr are immediately introduced as *Geirmundr heljarskinn ok Hámundr heljarskinn* (M30n5). Therefore, it appears her addition was intentional to enhance the mythology of the brother's settlement narratives and a subservient female-female relationship—happening in the homelands with one of the women unnamed—would have been easy to work in without massive socio-political repercussions.

Women in *S* do not have any relationships with other women that can be considered 'extra kin' that is an interaction where both parties enter of their own volition (Bell 1981, 10). There is no evidence in *S* for female friendship and participation in non-kinship-based relationships created through voluntary or unvoluntary circumstances like enslavement, emigrating to Iceland together, or settling near each other (see above). The lack of voluntary homosocial bonds between women raises the question if it was an intentional literary convention to suppress or exclude female friendships and their 'extra kin' same-sex relationships or if the frequency of female-female relationships reflects social dynamics in settlement society?

Examinations on the distribution of female friendship in the *Íslendingasögur* supports the former suggestion. Durrenberger and Gísli Pálsson (1999, 69) have noted the lack of female homosocial bonds in the sagas and have identified friendship as a predominantly a male affair. Van Deusen (2014, 54) has argued that female friendship was strategically presented in the sagas 'in a way that works to preserve both the political and social structures of kinship-based Old Norse society, which were based on clearly divided gender roles'. This theory can be applied to *S*, where women appear in their expected, 'traditional' roles of mothers, daughters, and wives which do not disrupt kinship models or threaten connections between men or male-female relationships. Even *landnámskonur* like Auðr, do not disrupt the

socio-political system because they first act in the capacity of a *landnámsmaðr*—a gender non-exclusive role and as a woman second, but they are still women. In this way gender differentiates male settlers/men from the *landnámskonur*/women because they have regular access to a wider array of same-gender relationships.

6.4 A Small World?: Quantitative Analysis of the Impact of Women in the Narrative Network of Sturlubók

Comparative VA between the narrative network and male- and female-only graphs, suggests that women increase the connectivity of the network by facilitating as intermediaries between men (see 6.3). To confirm these cursory visual observations, the underlying structure of the network must be analysed using quantitative metrics to see if women add value to the network or if men-only networks are quantifiably more stable.

The quantitative metrics used to determine if women increase the interconnectivity in *S* are average degree, average path length, number of triangles, and global clustering coefficient. These measures have been selected because many are used to identify 'small-world' networks, which are networks where any two nodes in the network can reach each other through a short series of paths. The results of running each of these measures in *Gephi* are shown in Figure 102.

Network	Number of Nodes	Number of Edges	Average Degree[120]	Average Path Length	Number of Triangles	Global Clustering Coefficient
All-Gender	3112[121]	8128	5.224	8.993	12168	0.450
Men-only	2306	4311	3.739	10.566	4385	0.391
Women-only	706	485	1.374	2.035	278	0.628

Figure 102 Metrics showing how the connectivity of the network is impacted if women or men are removed from the narrative network

[120] All numbers are rounded to nearest hundredth.
[121] Includes non-human entities and groups in count.

6.4.1 Average Degree and Average Path Length

When women are removed from the narrative network the average degree of the network, the average number of edges/relationships per node has in the network, reduces from 5.224 degrees to 3.739. When men are taken away from the all-gender network, the average degree steeply declines from 5.224 to 1.374. Networks with higher average degrees tend to be more robust and are more capable of maintaining functionality if random nodes are removed or if there is an attack on the network, e.g. the spread of a disease in a population (Barabási 2014; Martin and Niemeyer 2021).[122] The decline in degree in the single-gender networks indicates that the mixed gendered network is more robust. This can be attributed to cross-gender relationships like marriages and father-daughter relationships that create underlying bonds in the network, which allow people to connect to two or more kinship groups.

The average path length is a measure of the average number of steps, across the shortest path—minimal length between two nodes—for all pairs of nodes in the network. The average path length between nodes increases from 8.993 in the all-gender network to 10.566 in the male-only network.[123] In other words, it takes an individual on average a little under nine connections to reach any other person in the all-gender network. In the male-only network, it would take a man around eleven relationships to reach another man. This shows that women make the network more efficient because relationships and information can be more easily channelled throughout the network. More specifically it is easier to move through genealogies and establish connections between families because women more readily link disparate areas of the graph. The average path length for the women-only network is misleading because although the length decreases drastically, it is not an accurate reflection of their ability to connect with other women. Average path length is simply what the path length between nodes in the network will most likely be. Since most women are either isolated from each other—path length of zero—or are clustered in small groups

[122] Robustness measures are not the same as centrality measures. They have not been computed at present, but could be a future application of SNA to *S.* See Barabási (2014, ch.8) for more on network robustness.
[123] Average path length is also called the average degree of separation.

of often made up of no more than five women, their average path length will be artificially low. Therefore, this measure is not useful to apply to the women-only network. It can be employed to the mixed gender and male-only networks because they are more interconnected.

6.4.2 Triangle Count

Community structure is closely tied to triangle formation and count. A triangle is a complete subgraph of three nodes where each node has a relationship with the other two nodes. For example, if *A* is married to *B*, and they have a child *C*, their combined relationships would form a triangle. If *C* has a friend *D* that does not know *A* or *B* this person will exist outside of the triad, but they still have access to the other members via *C*.

Triangles are generated through two main processes homophily—where individuals tend to form relationships with others like themselves—and transitivity—where friends of friends often become friends themselves (Wasserman and Faust 1994; Kolountzakis 2012, 163). The higher the triangle count of a network, the higher its density—the number of potential connections in a network which are actual connections.[124] More triangles also lead to increased transitivity and diffusion of information throughout the network because of the principle that friends of my friends are my friends (Wasserman and Faust 1994). It is easier to create relationships via a mutual acquaintance than from scratch. Additionally, if random nodes are removed from a network with a high triangle count, the network is not as likely to collapse because there is not as strong of a reliance on singular nodes to bridge structural holes—gaps between individuals in the network (Burt 1995; 2004).

Triangles drastically decrease in number from 12,168 triangles in the all-gender network to 4,385 in the male-only network and 278 in the female-only network. This downward trend indicates that women facilitate triangle creation. The addition of women generates strong triangles because they function as intermediaries between two family groups, serving as the entry

[124] A potential connection is an edge that could exist between two nodes, regardless of if there is a relationship or not. An actual connection is a realised relationship between two individuals.

point for individuals from her side of the family to interact with her husband, children, and affinal kin and vice versa. These opportunities for interaction increase network transitivity. Homophily is also improved when a woman has a child because a common descendant—who in the future will be considered a shared ancestor—fully realises the unification of two kin groups at a point in time.

In male-only networks, mother-father-child triads cannot exist. Father-son dyads are not as structurally strong as these triads for a multitude of reasons (Simmel 1964; Yoon et al. 2013). In dyads, social relationships tend to be more intrapersonal and susceptible to variability because the two individuals must cooperate to make the relationship work. If the tie breaks down, it is harder to repair because individuals might personalise the falling out and there is no form of mediation via a third person or outside force pushing for reconciliation. On the other hand, 'triads constrain emotions, reduce individuality, and generate behavioural convergences or uniformity because of "two against one" social pressures' (Simmel 1964; Yoon et al. 2013, 1457).

Returning to the example, the dyad of *A* and *B* would act as a constraint on *C* perhaps even influencing who they would interact with in the network because they are all impacted by the others' relationships.[125] In male-only networks these forces are effectively lost because there are few triads stabilising relationships between men. Additionally, transitivity is decreased when women are taken out of the network because it removes the ability for men to access their maternal kin through direct consanguineous kinship ties. Men would then have to make use of other types of relationships to interact with men from their mother's side and if these relationships are not recorded in the text they will not visualise in the male-only network (Figure 94). Therefore, the dramatic decline in triangle count is not so much a result of the decrease in population, but rather the gaps created in the network in areas where women were previously located. This once again demonstrates that the inclusion of women in roles of wives, mothers, and daughters is crucial for the development

[125] Some triads are based on negative relationships like two individuals in a dispute against a third.

of a stable community structure which functions like a ‘small-world network’—see 6.4.4—because women increase transitivity and homophily.

6.4.3 Clustering Coefficient

There are two versions of the clustering coefficient measure: the global and local. The global clustering coefficient detects the degree to which nodes cluster together in a network.[126] The local clustering coefficient quantifies how well-connected an ego, an individual node used as a starting point, is to its alters, their friends, companions, etc.[127] It measures how close the ego’s neighbours, nearby nodes on a network graph, are to becoming a complete graph or clique, a group of individuals where every person is connected directly to everyone else. The average or global clustering coefficient repeats this process for every node/ego in a network and then averages out the results. The higher the global clustering coefficient the denser and more well-connected the network is. Networks with lower global clustering coefficients are sparser with not as many people forming relationships.

When women are removed from the all-gender network the global clustering coefficient decreases from .450 to .391. Meaning that the male-only network is sparser than the all-gender network and there is a lower probability of a relationship being established at random between any two men. This is important because the higher the global clustering coefficient the more likely the network is a ‘small-world network’.

[126] It is important to make the distinction that the clustering coefficient does not measure of centrality—how important a node or edge is—like degree, betweenness, closeness, or eigenvector centrality, but measures clustering in a network (Hansen et al. 2011, 31-50 esp. 41). The global clustering coefficient is also known as the average clustering coefficient.
[127] The local clustering coefficient is also known as neighbourhood density. The ego is the individual at the centre of an egocentric network, a network that maps connections to and from an individual person.

6.4.4 Small-World Network

Watts and Strogatz (1998) introduced the concept of 'small-world' networks. These networks are characterised by having high levels of clustering and short average path lengths (Telesford et al. 2011, 367).[128] Another feature of small-world networks is that there are typically a few hubs (Watts and Strogatz 1998, 440).[129] Popularly, the small-world phenomenon is known as 'six degrees of separation', which is the concept that another individual is only six degrees or fewer from another (Milgram 1967, 60–7; Kochen 1989; Watts and Strogatz 1998). These properties enable small-world graphs to be used as 'models for the interaction of complex systems' because their network topographies act like and resemble 'real-world' networks, regardless of the whether the social relationships are extracted from 'real' or completely fictional sources (Amaral et al. 2000, 11149; Labatut and Bost 2019, 47-8).[130]

To determine if a character, real-world, or social network can be classified as a small-world network, the network's average shortest path length and clustering is usually compared to a similarly-sized random network, a network where a set number of nodes are connected randomly based on fixed probabilities (Humphries et al. 2006; Telesford et al. 2011, 367; see also Erdős and Rényi 1959 for random graphs). Comparing the narrative network of *S* to random networks is outside the scope of this study, therefore, analysis is limited to whether the addition of women in the narrative network increases its small-world properties and, if so, what are the potential implications?[131]

When women are in the narrative network (Figure 91), they decrease the average path length and increase the global clustering coefficient (Figure 102) the two main properties of small-world networks. Additionally, Auðr

[128] For more background on small-world networks and how they are unique from other networks see Erdős and Rényi (1959); Watts and Strogatz (1998); Newman et al. (2002, 2567-8); Albert and Barabási (2002).
[129] In the narrative network prominent settlers function as the main hubs see 5.3.1.c.ii and 5.3.1.c.iii.
[130] There are different classes of small-world networks: scale-free, broad-scale, and single-scale (see Amaral et al. 2000), and different definitions of 'small-world' but for simplicity Watts and Strogatz's (1998) model is used which most resembles scale-free network topologies.
[131] MacCarron and Kenna (2013) have analysed the properties of eighteen *Íslendingasögur* and found that compared to ancient and mythological sources, the *Íslendingasögur* operate most like small-world networks sharing many structural properties with real-world networks.

serves as an important hub (another indicator of small-worldness) facilitating short path lengths in the network and when women are removed so are these pathways. Thus, women increase the small-worldness of the narrative network and when they are not present, the network decreases in small-worldness. Considering that many small-world social networks are also 'real-world' networks—including human society—the inclusion of women could indicate that the compilers of *Ldn* formatted genealogical information in a manner that reflected their perceptions of 'actual' medieval Icelandic society—whether it be from the settlement period, thirteenth century, or both (Milgram 1967).[132] In this way, *S* and the other versions of *Ldn* could be said to be literato-historical texts documenting 'real-world' social structures or at least emulating them as a feature of the genre.

This idea particularly holds true if the presence of women who were non-settlers in *S* were 'optional' inclusions. The women inserted in the text could have been purposely included to serve some type of social, political, or geographical function including but not limited to increasing the prestige of certain families, linking kin groups through marriage, or providing rationalisation for a place-name that includes a fem. element, e.g. Þórdís and Þórdísarholt (S179; see below).[133] Additionally, if the bias towards recording men in the text is representative of patriarchal attitudes in medieval Icelandic society, it could be considered an 'accurate' depiction of society in the eyes of the compilers even though in modern view it does not represent of total population of medieval Iceland. Nevertheless, this raises the question of whether there was a more 'realistic' number of women in *S*, if the network would increase in small-worldness and operate even more like a 'real-world' network? This inquiry cannot be explored at present, but based on the evidence it is likely. On the other hand, artificially inserting women into their 'implied' positions in genealogies may make the network less 'real' in the sense that the

[132] This network cannot make full use of the 'the six degrees of separation' principle because it assumes that the individuals connected in a network are any set of people alive at one time and *S* is intergenerational (see 2.4.2.a.iv)

[133] Þórdís, daughter of Ingimundr *enn gamli*, was born at Þórdísholt, while he was delineating his land-claim boundaries through the act of place-naming, *Þórdís dóttir hans, var alin í Þórdísarholti* (S179). See Barraclough (2012, esp. 86) for more discussion on place-names in Ingimundr's claim).

narrative network does not emulate the original text and thereby further distorts the original compiler's worldview by visualising connections he did not include. Therefore, this approach would not 'accurately' portray thirteenth-century perceptions of settlement society.

This is just an initial exploration into how the historicity of *S* can be explored using small-world properties. To definitively state whether the network of *S* is small-world, it needs to be compared to complex and real-world networks of an equivalent size. Based on the initial evidence and MacCarron and Kenna's study (2013), the network of *S* will likely be considered small-world. What can be said definitively is that the inclusion of women in the network increases the small-worldness of the network, which even if its population does not correspond to any actual segment of 'real-world' Icelandic society, make the narrative seem more realistic.

6.5 Relationship-level Analysis: Marriages and Weak Ties

The network-level VA and SNA show that women increase the small-worldness of the narrative network because they shorten the average path length between nodes and increase the level of clustering in the network (see 6.4). To investigate how women influence these metrics, husband-wife *dyads* 'a subgraph the size of 2 consisting of a pair of actors [(nodes)] and all ties [(edges)] between them' are examined to see how they function in the narrative network (Wasserman and Faust 1994, 507). Researching the husband-wife dynamic is integral to understanding how women act as bridges in the network because they facilitate relationships between regional kin groups, many of which would otherwise have no connection with each other in the text.

A woman connects her husband's kin group to her natal family's through weak ties. Traditionally, weak ties are formed with acquaintances or strangers through infrequent meetings (Granovetter 1973). On the other hand, strong ties develop between people who are closely related and in are frequently in contact like family members and friends.

In this network father-daughter relationships—despite being long-term commitments—function as weak ties. This is because upon marriage a woman socially and physically moves from her natal kin group to join her husband's (see 6.5.2). For instance, if A, is the father of B, B's relationship with her father would shift from a strong tie to a weak tie because after she marries her husband C, she would presumably interact with her father less and their relationship would become 'weaker'.[134] On the other hand, B and C's relationship would develop into a strong tie. Nevertheless, B can still access her kin group through this weak tie allowing C to call upon his in-laws—A and his cluster—via his wife, even if they do not frequently cooperate.[135]

Marriages in *S* create weak ties in the narrative network, which when establishing a network structure are more influential than strong ties. Weak ties generate more connectivity in the network, help disseminate information at a faster rate, and bridge sub-clusters (family groups) which would otherwise have no relationships in *S*. It is no surprise then that there is as much of an emphasis on the affinal relationships—particularly marital ones—in *S* as consanguineal ties, even though they are outnumbered (Clunies Ross 1993, 378). In ON-I texts, marriages not only join a man and wife, but also merge kin groups in a manner that benefits the overarching society by striving 'for an equilibrium among those holding power' (Meulengracht Sørensen 1993, 22, 36; Bandlien 2005, 245). Marital arrangements can end feuds, create affinal and political ties, and consolidate land and property (Frank 1973; Jochens 1995, 21, 28). However, marriages can also end through a divorce or with one of the partners dying. These situations and/or an additional marriage potentially could destabilise the connection between the two original kin groups, especially if no children were produced from the union. The wife could have also had a falling out with her birth family, or her closest familial contact might have passed which would further weaken her relationships with her birth kin. In this sense marital relationships are fragile because they are held together

[134] This is a generalisation of father-daughter relationships to illustrate broad marital patterns.
[135] Fathers-in-law and sons-in-law likely communicated more in 'real-world' medieval Icelandic society than presented in the text. Father-in-law and sons-in-law relationships are only recorded if explicitly mentioned. This decision preserves that the text does not often record in-law relationships and highlights the importance of women making the connection between these kin groups.

through social and moral constructs and therefore can be altered unlike ties based on consanguinity. In this way marriages not only attempt to establish an equilibrium throughout the overarching society, but each husband-wife dyad also balances relationships at the individual and familial levels.

6.5.1 A Match between Equals: Marital Relationships over Space

This striving for equilibrium between families can be seen in Figure 103 which highlights where affinal relationships are in the narrative network.[136] Affinal edges stretch across the network connecting family groups that were previously socially distant, even if they are geographically close to each other. This is seen more clearly when looking at the colours of nodes being connected. Most nodes are connected to nodes of the same colour. This indicates that geography influences marital arrangements and individuals usually marry another person from their Quarter. It is rare for an individual to marry someone not from their Quarter. This is evidenced by the lack of affinal ties connecting two nodes of different colours on Figure 103.

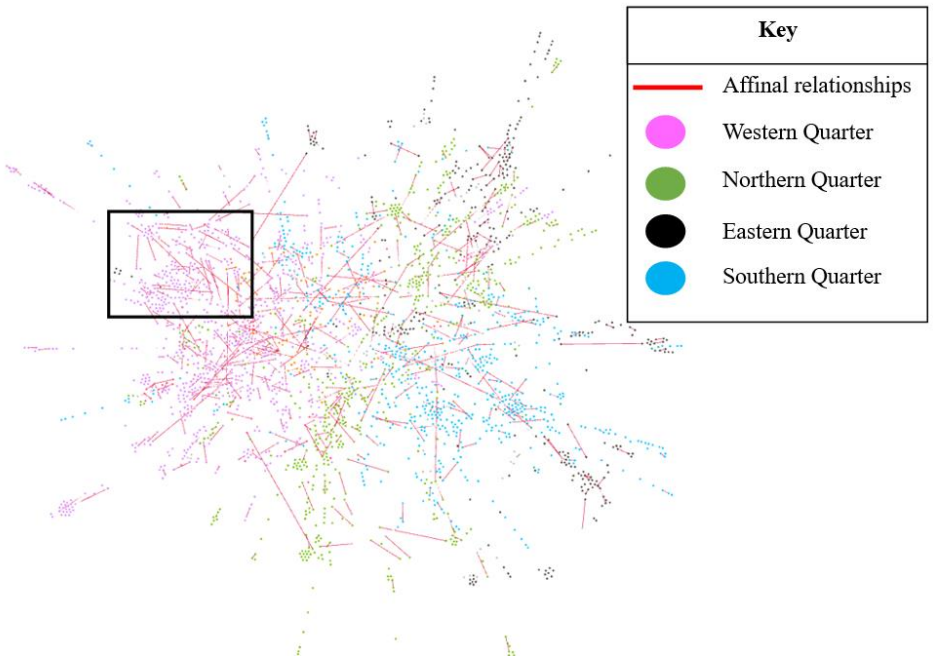


Figure 103 Visualisation of main subcomponent of narrative network with affinal relationships

[136] This includes all affinal relationships, but husband-wife relationships make up most of these connections.

This marital pattern can be seen more clearly in Figure 104, which is a magnified image of the area in the black box in Figure 103. In Figure 104, most of the affinal edges are between individuals who have some association with the Western Quarter. To demonstrate how women function as bridges connecting families living in the same Quarter through marriage, the marriages between Jódís and Már, and Herþruðr and Þorgrímr, are used as examples (S87).

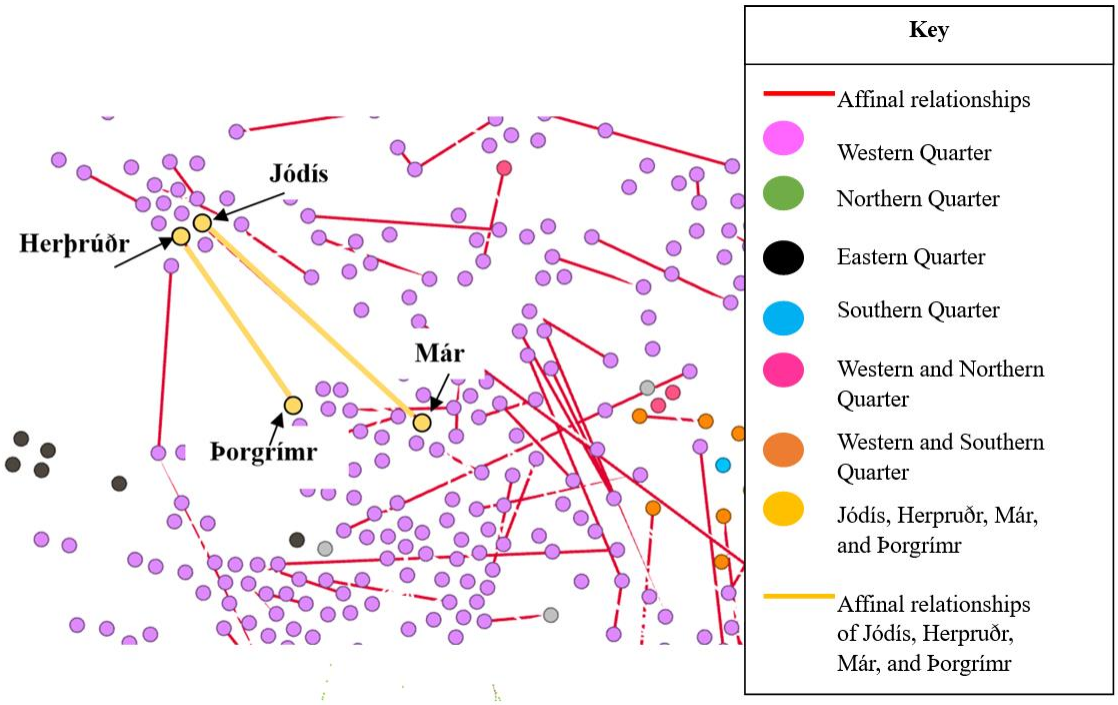


Figure 104 Magnified view of Figure 103

The sisters Jódís and Herþrúðr are daughters of Illugi *enn rammi* who the Langdœlir descend from, *Frá Illuga eru Langdœlir komnir*. Jódís married Már a member of the Reyknesingar, and Herþrúðr married Þorgeirr, who comes from the Kjalleklingar (ÍF I Ættaskrá VIIa-b, X). These marriages bridge the social gaps between these three family groups, which up to this genealogical point had no connections in the text. These affinal ties also better reflect the geo-political reality of these individuals because the groups all live near each other. In Figure 105 the yellow markers indicate the bases of each of the families (S84-S85, S87, S111, S122, S398). The southernmost marker on the map is located at Langdalir, the area associated with Jódís and Herþrúðr's natal family. This area can now be linked to Fell—the farm established by Þorgrímr's grandfather—via the marriage of Þorgeirr and Herþrúðr. This

connection is shown as the red arrow going from Langdalir to Fell in Figure 105. Reykjahólar, the farm of Már's father Illugi *á Reykjahólum*, through the marriage of Jódís and Már, which is shown as another red arrow on Figure 105. Since these estates are roughly of equal size, it stands to reason that these powerful families would want to foster positive ties and consolidate power within their region.

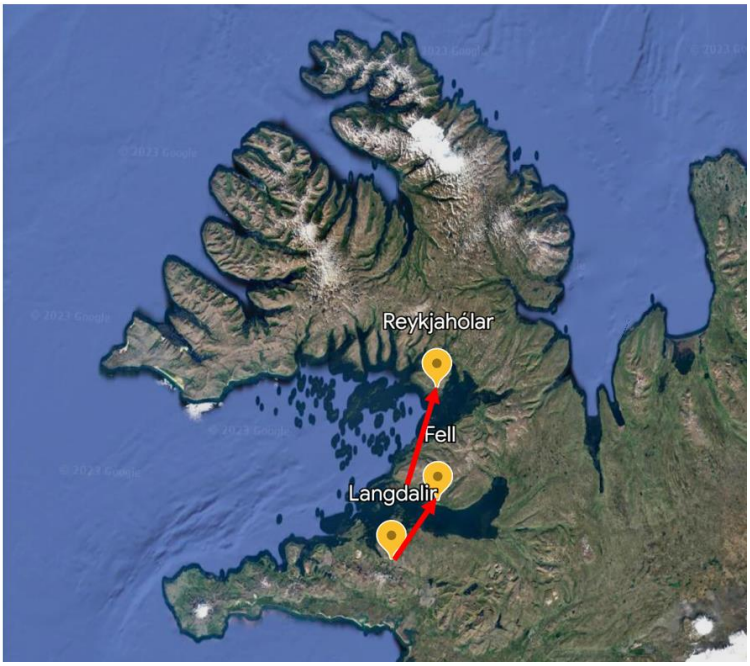


Figure 105 Virilocal movement of Jódís and Herþrúðr from Langdalir to their marital residences

However, these affinal ties cannot be taken directly from Figure 104 and projected onto the Icelandic landscape. Although Figure 104 corresponds to the geographical layout of medieval Iceland, nodes and edges exist in a 'created space' not governed by physical boundaries (see 3.1). To create Figure 105, another methodology based on the principles of marital movement was employed to ensure that Jórdís and Herþrúðr are attached to the correct locations like Langdalir and their marital farms. Applying this approach to marital relationships *en masse* shows the socio-geo-political impact of affinal connections on the 'actual' geography of Iceland, not just in an artificially constructed space.

6.5.2 From Graph to Map: Mapping Affinal Relationships in *Sturlubók* with Virilocal Movement Patterns

6.5.2.a Marital movement methodology

Residential patterns in medieval Iceland generally prescribe to principles of virilocal movement, where a woman resided with her husband or his kin group after marriage (Jochens 1996, 150-5).[137] In *S*, the movement of a woman from her father's residence to her husband's domicile is usually assumed and typically not stated. There only are a few exceptions to this general pattern i.e. if she receives land as part of her dowry and the new couple moves to her land (e.g. S282). Her change of residence is implied in formulaic phrases like X *átti* Y and X *fekk* Y, 'X was married to Y', e.g. *Herþrúðr, er Þorgrímr Vermundarson átti Herþrúðr*, 'Herþrúðr, who Þórgrímr, son of Vermundr married' (S87). If the locations of the father's and husband's properties can be identified, then this virilocal route can be reconstructed. This not only unveils residential patterns but further contextualises the societal, geographical, familial, or economical relationships that led to the merging of kin groups through marriage.

Taking an affinal relationship from the created space of a network graph and transforming it into a meaningful geographical relationship requires three elements:

- The woman who is moving because of marriage.
- The locale of her father or a natal relative associated with her.[138]
- The farm of her husband.

If any of these elements are missing, then the affinal-geographical connection between places cannot be established and visualised—this does not mean these relationships did not exist—so not all affinal relationships are mapped onto the

[137] This thesis uses Fortunato's (2009, 74) and Keesing's (1975, 37) definition and usage of the terms virilocality, uxorilocality, for residence with or near the wife's kin, and neolocality 'for residence apart from the kin of either spouse'. The term patrilocal has evolved over time and often assumes that the new marital unit is 'aggregated in patrilocal and patrilineal groups' (see Fortunato 2009, 74 for how the definition has evolved over time). Here patrilocal and matrilocal are synonymous with their more general counterparts virilocal and uxorilocal.
[138] Other individuals such as uncles or mothers could give away women in marriage if a father was not present; however, these are rare occurrences.

landscape.[139] These elements are important because they help capture the roles of women at different points in time. The movement of a woman from her natal residence to her marital residence signifies her transition from a daughter—and to a lesser extent a sister—to a wife and mother. At the marital residence, a woman functions first as a wife and potentially becomes a mother. This is an abstraction of medieval Icelandic residential patterns because each marital arrangement would have featured its own distinct elements, some marriages do not follow normative patrilocal patterns, and some women could have lived at more than two residences in their lifetimes. Nevertheless, virilocal movement was the norm and for most women enough familial, marital, and residential information is known to reproduce patrilocal movement and uncover new social and geographic patterns based on marital relationships. These independent instances will then be collated to analyse overarching residential marital patterns.

To demonstrate how virilocal movement is reconstructed at an individual level using these three elements, Geirbjǫrg's marriage chapter in S33 (Figure 106) is used as an example to explain the intricacies of this methodology.

> *Þorgeirr meldún þá lǫnd ǫll at Birni fyrir ofan Grímsá; hann bjó í Tungufelli. Hann átti Geirbjǫrgu, dóttur Bálka ór Hrútafirði; þeira son Véleifr enn gamli.*
>
> (S33)

> Þorgeirr *meldún* received all the properties above Grímsá from Bjǫrn; he lived at Tungufell. He married Geirbjǫrg, daughter of Bálki of Hrútafjǫðr; their son was Véleifr *enn gamli*.

Figure 106 Excerpt of S33

Geirbjǫrg is the only woman mentioned in S33. She is identified as a woman because she has an ON-I feminine personal name, her name is coloured red in the excerpt. To determine Geirbjǫrg's birth family residence, her father or a close natal family member who is associated with a location must be identified. This is achieved by parsing for ON-I male personal names, place-names, and markers of familial relations (see 2.3 and 2.4). Here it is apparent

[139] These elements are recorded in the 'marital_movement' sheet in the database (see 2.6).

that her father is Bálki, because the text explicitly states that she is his daughter. If a father of a woman is unknown, then she is removed from a dataset because her initial location cannot be established. The residence of her father or family member is found by looking for locational bynames, statements of habitation e.g. *bjó*, and prepositions of place e.g. *ór* 'out of, from' [place], *á* 'of [place] on, upon, in [place]', *frá* 'from [place]', *at* 'denoting presence at, near, by, upon[place]', or other contextual geographic information (ONP). Bálki is associated with Hrútafjǫrðr based on the prepositional statement *ór Hrútafirði* 'of Hrútafjǫrðr'. The coordinates for Hrútafjǫrðr used on maps are taken from ISM.

The marital residence of a woman is established by identifying her husband and his property. Geirbjǫrg's husband is Þorgeirr *meldún* who lives at Tungufell. Both his name and the place-name are explicitly stated. The coordinates for Tungufell are then entered as Geirbjǫrg's marital residence.

The place associated with an individual is only as specific as the text allows. In ideal circumstances an individual is attached to a farm like *Ísleifr bjó á Ísleifsstǫðum* 'Ísleifr lived at Ísleifsstaðir' (S47). In this case, latitude and longitude coordinates for the farm are entered from ISM. In some instances, the farm may be known, but its location has been lost to time. If the general region of the farm is known, then its ISM coordinates will be attributed as the natal residence of the woman. Many individuals like Bálki are only identified by a geographic region like Hrútafjǫrðr. Complete accuracy, although desired, is not necessary because general patterns of female movement between regions still provides insight on overarching residential strategies. If a farm or region of an Icelander is unknown, then the women's movement cannot be tracked, and she is removed from the dataset because a generic point denoting 'Iceland' would not be able to provide insight on intra-island marital movement.

Countries and regions outside of Iceland are also input into the dataset as natal or marital locations. For instance, Ketill *veðr* of Hringaríki, Norway and King Bjólan of Scotland are fathers of Yngvildr and Niðbjǫrg respectively and these locations are conceptualised as their natal residences because they are their presumed points of origin (S84). Coordinates for regions and countries

are also taken from ISM. It is important to record marriages that reference locations outside of Iceland because they are evidence of diasporic connections. However, in the interest of focusing on marital movement patterns in Iceland and producing easier to interpret maps, international virilocal routes have been removed from the dataset used for the case study in 6.5.2.b. (see below).

Locations connected to individuals are not always explicitly mentioned in the chapter where the woman is first referenced. Therefore, if a father, family member, or husband can be linked to a place within one degree, that location is input. For instance, if a man is the son of a settler, it can be reasonably assumed that he would inherit his father's land-claim—unless otherwise stated—based on the medieval Icelandic inheritance procedures (*Grágás* 47-74). Fathers and sons do not always live at the same location; however, making this assumption allows for more connections between places to be uncovered.[140]

Once the natal and marital residences are established, then a woman's marital movement can be constructed. A woman's natal residence is used as the starting point of her path and the marital residence is the end point. The coordinates of the locations are then plotted onto a map using Google Earth. A line is drawn between the residences which signifies the movement of the woman. For Geirbjǫrg's marital movement, her father's location, Hrútafjǫrðr is mapped as shown in Figure 107. Next her marital residence, Tungufell is plotted. A line is then drawn from Hrútafjǫrðr to Tungufell that illustrates Geirbjǫrg's movement between the farms, this line broadly shows how far Geirbjǫrg may have moved and links two locations. There is an attempt to use the shortest distance between the residences, the aim is not to find the actual route taken or actual distances travelled, but to find potential patterns of movement and connections between households.

[140] Each location is assigned a value of 'exact' or 'one degree' in the database to indicate level of certainty.



Figure 107 Geirbjǫrg's marital movement

Of course, some wariness of concrete residence rules is warranted because there is a 'multiplicity of possibilit[ies] [regarding] residence at marriage' in ON-I sources and personal circumstances dictated where newlyweds would settle (Miller 1988, 334; 1990, 125-7). However, since marital movement in *S* is primarily virilocal, the present geo-relational approach has been tailored to only examine this type of marital movement.[141]

6.5.2.b Marital movement in Sturlubók

Using the methodology described above, 187 marital routes have been extracted from the 399 chapters of *S*. This sample does not include all women mentioned in the text because the parameters of the methodology exclude women who do not meet the criteria for tracking virilocal movement. Nevertheless, there are enough routes from each Quarter to make reasonable inferences about regional marital relocation patterns in *S* (see 3.1 and 3.2). As a result, the reconstruction of these affinal paths on Iceland's physical terrain has the potential to add better the understanding of 'authentic' socio-geographical connections.

Figure 108 is the result of mapping the virilocal routes extracted from *S* on Iceland's landscape. Each marker represents either a natal or marital

[141] In the future, this approach can be expanded to include other forms of marital movement i.e. uxorilocal and neolocal.

residence and each colour corresponds to a different Quarter (see 3.4). The lines on the map each correspond to the virilocal movement of a woman and link her familial home to her marital residence. If both locations are in the same region, then the colour of the line matches the colour of that Quarter. If the residences are in different Quarters, the line's colour will correspond to the Quarter of the natal residence to indicate direction of movement.

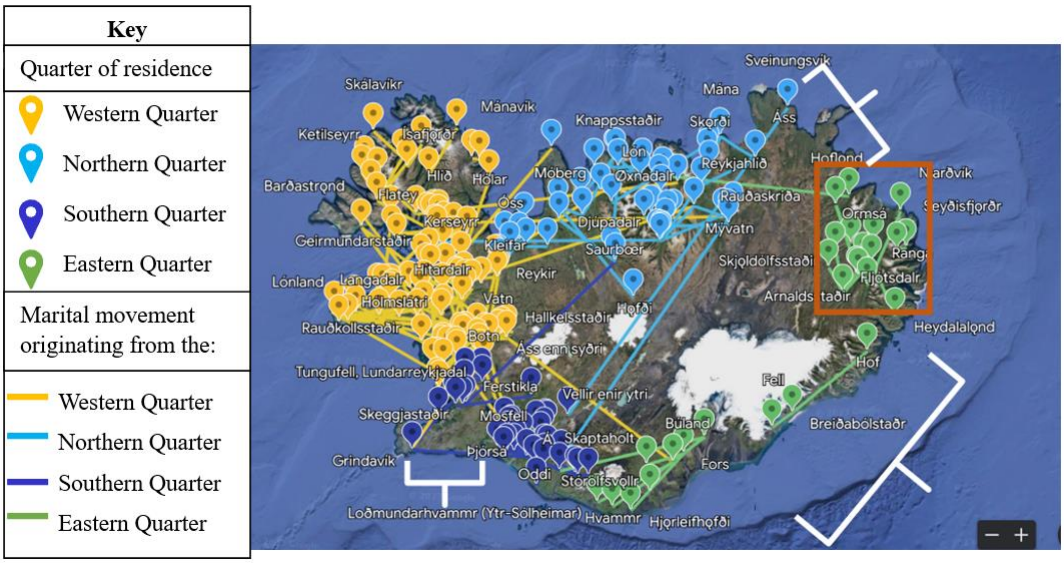


Figure 108 Map of virilocal movement patterns in Sturlubók

Figure 108, shows that most women do not leave the Quarter of their natal residence. This is evidenced by the dense interconnections between markers of the same colour and very few cross-region connections. Even in cases where a woman moves between regions, she will relocate to a nearby farm in the bordering region. For example, women from the southernmost farms of the Western Quarter are more likely to marry into families located in the Southern Quarter than into those of the Westfjords. Here proximity supersedes Quarter boundaries, and the former movement pattern is more logical and 'realistic' than creating a connection with someone in the same Quarter who lives far away. There appear to be only three connections between the geographically opposing Northern and Southern Quarters which appear in the middle of the map. There appears to be only one marital path linking the Western and Eastern Quarters.

There are a few areas in Figure 108 indicated by the white brackets that virilocal movement paths are virtually absent. These regions are: the southern half of Reykjanes, the southeastern coast of Iceland, and Melrakkaslétta and Langnes in the northeast of Iceland. Considering that the regions on either side of the southern coast of Reykjanes, are densely populated with patrilocal routes, it would be expected that there would be more marital paths here. However, the absence of patrilocal routes here is due to the region being part of Ingólfr's massive land-claim. Only two people are said to settle or farm on the southern half of the peninsula outside of Ingólfr, the sons of Molda-Gnúpr and Þórir *haustmyrkr* (S9, S329, S393). Therefore, the dearth of affinal connections here is explained, but it raises the question if this area was relatively isolated from other districts or under the strict authority of one family and did not need to make connections with outsiders.

The gaps in marital relationships across the southeastern coast of the Eastern Quarter, could be another indicator of Kolskeggr's laconic style, or a lack of farms in the region (see IV). The almost formulaic constructions in his section reduce the number of women and affinal relationships recorded (see 4.3.1; Adolf Friðriksson and Orri Vésteinsson 2003, 143). Without women, virilocal movement patterns cannot be reconstructed. There is a discrepancy of marital movement with the northern portion of the Eastern Quarter identified by the orange box in Figure 108—which is not attributed to his hand—having much more interconnectivity than the eastern coast of Iceland—which is attributed to Kolskeggr. However, marital pathways reappear at the expected rate in the border region of the South and Eastern Quarters. This may indicate that Kolskeggr's influence in *S* might end before the Eastern Quarter's boundary chapter (S335), which is usually considered where his contribution ends (ÍF I cvi-cx; Callow 2011, 17).

The chapters corresponding to the Melrakkaslétta and Langanes peninsulas, S258-S265, rarely mention women, therefore, it is unsurprising that only one marital route appears in this region in Figure 108. However, this path does not seem to be an outlier, but rather an exemplar emphasising a pathway to reach the Southern Quarter from the Northern Quarter. Normally an

individual starting a journey from one of these Quarters would have passed through the Western or Eastern Quarter to reach their desired destination. In S259 Arngeirr claimed the whole of Slétta between Hávararlón and Sveinungsvíkr. He had two sons Þorgils and Oddr and a daughter named Þuríðr who married Steinólfr of Þjórsárdalr—which is in the Southern Quarter. Arngeirr and Þorgils were killed by a polar bear. Oddr avenged his father and brother by slaying the polar bear, taking the carcass home, and eating the whole bear. However, this act caused Oddr to become an evil man and imbued him with some powers of sorcery. It was said that *hann var hamrammr svá mjǫk, at hann gekk heiman ór Hraunhǫfn um kveldit, en kom um morguninn eptir í Þjórsárdal til liðs við systur sína, er Þjórsádœlir vildu berja grjóti í hel*, 'He was such a great shape-changer that one evening he set out from Hraunhǫfn [the northernmost tip of Melrakkaslétta], and arrived the next morning in to help his sister when the people of Þjórsásárdalr wanted to stone her to death'. This not only is a remarkable feat in terms of time, but also the journey is risky because one must go across the harsh highlands of Iceland to reach the Southern Quarter from the Northern Quarter.

The difficulty and peculiarity of Oddr's trip make it an ideal mnemonic referent. The anecdote and characters associated with it 'gave structure and order to the landscape, helping to make places memorable and to fix their relative, topographical positions in people's minds and thus aid physical (as well as ideological navigation' (Lethbridge 2016, 77). Although the specifics of this route are not explained, the tale illustrates that the journey is possible. It is likely that Steinólfr was included and attached to Þjórsárdalr to symbolise the point of entry into the Southern Quarter. He is not mentioned elsewhere in *S* and outside of *Ldn*, he is unknown (S259n1).[142] It would be expected that Þuríðr would have married into a family within her area or at least in a bordering region following established virilocal trends. However, it is this unhappy marriage that prompts Oddr to go help his sister and make the journey. If Þuríðr followed the norm and married a man living close to her natal farm, then Oddr's journey would have been unremarkable and not worth

[142] Matthías Þórðarson (1941-2, 13-4) speculates on this family's origins.

the narrative space. Instead, he forges and preserves a pathway in medieval Icelander's minds between the north and the south.

6.5.2.b.i Regional marital movement

Figure 109 is a selection of marital movement routes from Fljótsdalr in the Eastern Quarter which is taken from the orange box in Figure 108. Most women from this area do not leave the general vicinity of their natal homesteads which is evidenced by the short green lines marking their movement staying within the region. For example, Helga, whose father Bjólfr claimed all the Seyðisfjǫrðr (S290). Her father gave her in marriage to Án *enn rammi.* As her dowry, she received the north side of Seyðisfjǫrðr as far as Vestdálsá and the couple presumably lived in this area. Although the exact locations of Helga's natal and marital residences are unknown, Her marital movement can still be estimated because she would have not moved past the Vestdálsá when she changed homes. The line representing her movement is indicated by the orange arrow in Figure 109. This could be considered another case of uxorilocal movement because the couple as a unit moves but remains near the wife's kin.



Figure 109 Marital movement patterns in north-east Iceland

Based on Án's social-familial situation in Iceland, this placement could have been either advantageous or disadvantageous. If he had no other relatives in Iceland, moving closer to his wife's family would provide him with property but also nearby allies. On the other hand, his land and the affinal ties that come with it are conditional and rely on the marriage remaining intact. If Án chose to divorce Helga, the property would revert to her family and this support network would be lost. Additionally, if Án did have kin in Iceland, it stands to reason that he either did not get along with them and he moved away or was banished and unwillingly moved away from his kin group and this could cause emotional trauma. Another suggestion is that Helga wanted to remain near her kin, and it was a condition of the marriage. These are all plausible options, but none can be proven because there is no other information provided about the couple in *S.*

The only exception to this general pattern is Gunnhildr whose father Ísrøðr claimed and lived at Torfastaðir in Vopnafjǫrðr, the uppermost marker. She married Oddi, who likely lived at Hǫfði in the Northern Quarter, not pictured in Figure 109, but in Figure 108 would be approximately located in the easternmost section of the Northern Quarter (S108, S269).[143] Gunnhildr's marital path is indicated by the white arrow. Nevertheless, Gunnhildr follows general patrilocal patterns by marrying into a family whose farm is accessible from her natal home in a bordering Quarter.

6.5.2.b.ii The women who built Brynólfr *enn gamli*

To better highlight the concentration of marital routes around the Fljótsdalr node, all virilocal paths in the region that do not start or terminate at this node have been removed and Figure 110 is result of this removal. The Fljótsdalr marker represents Brynjólfr *enn gamli*'s residence because he claimed the entire valley and he is not associated with a specific farm in *S* (S280). Brynjólfr established himself as one of the *stærstir landnámsmenn* 'important settlers' of the Eastern Quarter by taking land, restricting land usage, and gifting land, creating dependent settlers in the process (S281, S335; see 5.3). Additionally,

[143] Oddi's location is determined through his father's association with the farm (S108).

Brynjólfr developed long-lasting relationships with neighbouring farms via the marriages of his children, primarily his daughters.

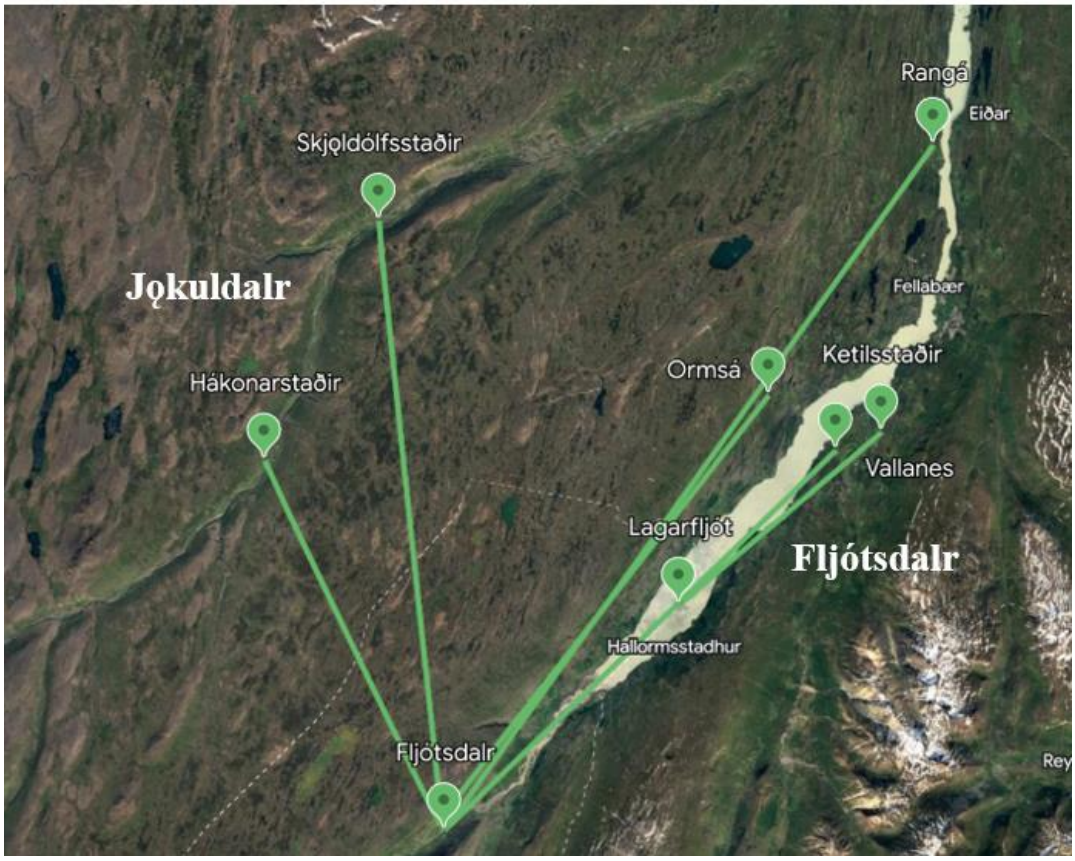


Figure 110 Virilocal routes to and from Fljótsdalr

Figure 111 lists the marital movement of Brynólfr's daughters: Fastný, Guðríðr, Guðný, and Ásvǫr; his daughter-in-law, Þorbjǫrg; and his step-daughter/niece, Ásvǫr.[144] Analysing these virilocal routes not only provides insight into geographical connections between nearby farms, but also how topography cannot be thought of as separate from the social and political landscape of medieval Iceland.

[144] Brynjólfr was the second husband of Helga, who was first married to his brother Herjólfr (S280).

Ch.	ON-I	Woman	Natal Residence	Husband(s)	Marital Residence	Approximate Distance to/from Fljótsdalr[145]
S274	*Hans dóttir var Þorbjǫrg, er áttu synir Brynjólfs ens gamla, Gunnbjǫrn ok Hallgrímr*	Þorbjǫrg	Hákonarstaðir	Gunnbjǫrn and Hallgrímr	Fljótsdalr	25 km
S275	*Þorsteinn, er átti Fastnýju Brynjólfsdóttur*	Fastný	Fljótsdalr	Þorsteinn	Skjǫldólfsstaðir	36 km
S276	*Þórólfr hámi, er átti Guðríði Brynjólfsdóttur*	Guðríðr	Fljótsdalr	Þórólfr *hámi*	Langarflót	49 km
S277	*Hann átti Guðnýju Brynólfsdóttur*	Guðný	Fljótsdalr	Qzurr *slagakollr*	Ormsá	32 km
S279	*Þórir, er átti Ásvǫru Brynjólfsdóttur*	Ásvǫr	Fljótsdalr	Þórir	Vallanes	35 km
S282	*Ásrøðr hét maðr, er fekk Ásvarar Herjólfsdóttur, bróðurdóttur Brynólfs ok stjúpdóttur*	Ásvǫr	Fljótsdalr? [146]	Ásrøðr	Ketilsstaðir	35 km

Figure 111 Marital movement of women related to Brynjólfr

It is apparent that Brynjólfr intentionally orchestrated marriages with nearby farms rather than attempting to build island-wide relationships or even connections with individuals living on the southeastern coast of Iceland. All the affinal marriage relationships he coordinated are confined to the neighbouring valleys of Jǫkuldalr and Fljótsdalr. The distances each woman travelled to or from Fljótsdalr appear to be all under fifty km. It is difficult to establish if fifty km was perceived as a short or long distance by medieval Icelanders in the Eastern Quarter, but these are the closest farms or topographical features in

[145] Km are rounded to the nearest whole number. The measure distance and area feature in Google Earth was used to calculate rough distances because there was no fixed standard for calculating road distance in medieval Iceland (Gurevich 1969, 52).
[146] The approximate between Heydalalǫnd and Fljótsdalr is roughly forty-nine km and the distance between Heydalalǫnd and Ketilsstaðir is also around forty-nine km, it is assumed that Ásvǫr moved to Fljótsdalr before Ketilsstaðir.

relation to Brynjólfr's land-claim. Therefore, it can be assumed that these farms were accessible from each other.

The pattern the affinal relationships in Figure 110 supports the idea that the consolidation of power begins at the hyper-regional level. A settler or their descendant seeks to establish relationships with their immediate neighbours, then gradually extends their influence forging relationships with individuals living in other parts of their Quarter. Once they have established enough authority in their region, they can participate in Iceland-wide affairs. Although, this is a small sample of one relationship type and people can build power in different ways (see V). Nevertheless, Figure 110 appears to be a microcosm for general marital movement trends and cursory visual analysis of Iceland-wide virilocal relocation in Figure 108 corroborates this observation. For definitive conclusions on how the movement of women impacts the establishment of a hierarchy, the distances for each route would need to be calculated and discussed, which is outside the scope of the present thesis. The results at present are promising and worth further research not only because they show how local and regional marriages influence power dynamics, but they also demonstrate how data gathered from SNA approaches can be reformatted and applied alongside other methods including mapping techniques.

6.6 Inclusive and Linear: Case Studies on the Function of Women at the Individual Level

As demonstrated at the network-wide and relational levels, women function as excellent regional bridges because they connect kin groups through marriage. Yet, outside of Auðr *djúpauðga*, how individual women make these links in the network has not been discussed (see 6.3.2.a and 6.3.2.b). To study how women operate in the text at a more granular level, micro-case studies on women in selected 'linear' and 'inclusive' genealogies are conducted (Jesch 2014, 273-4). In 'linear' patterns, genealogies descend to reach a desired, contemporaneous descendant or kinship group. 'Inclusive' patterns, add as much information about a settler and their immediate descendants as possible. In these genealogies women can take on a variety or combination of roles such as, but not limited to a *landnámskona*, a descendant of a *landnámsmaðr*, a wife, mother, sister. However, unlike men, inserting a woman into a genealogy—especially as a wife—allows her children to access not only their patrilineal lineage, but also their maternal ancestry.

6.6.1 Linear Genealogical Patterns

6.6.1.a From Bjǫrn to Brandr

In linear genealogies, where there are no strong patriarchal connections for a male ancestor to reach a desired descendant—usually another man—the lineage will be constructed to descend matrilineally. For example, in chapter S353, Bjǫrn *í Svínhaga* is linked to his descendant Bishop Brandr through a series of mother-daughter relationships starting with his own daughter Hallveig, *Hallveig, móðir Þórunnar, móður Guðrúnar, móður Sæmundar, fǫður Brands byskups* 'Hallveig, mother of Þórunn, mother of Guðrún, mother of Sæmundr, father of Bishop Brandr'. The mother-daughter relationships between Hallveig, Þórunn, and Guðrún establish a clear link between a *landnámsmaðr* 'settler' Bjǫrn, and their contemporaneous descendant, Brandr, who was bishop of Hólar from 1162-1201 (Sverrir Jakobsson 2018, 193). This five-step path starting at Bjǫrn, going through the mother-daughter relationships, and terminating at Brandr be seen in red in Figure 112.

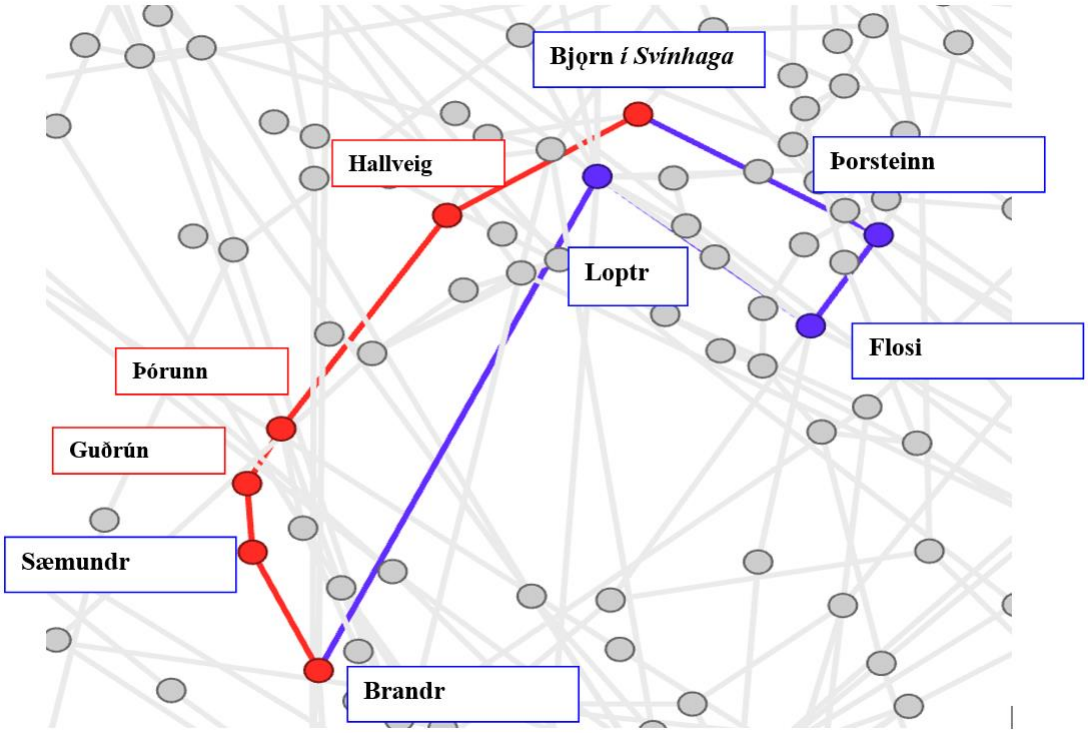


Figure 112 Network paths from Bjǫrn to Brandr

In Figure 112, it appears that Bjǫrn can use fewer steps and go through only males—blue path—to reach his descendant; however, on closer inspection these links are tenuous. The first step on the blue path is the connection between Bjǫrn and Þorsteinn. Bjǫrn does not appear to have any consanguineous kinship ties to Þorsteinn, instead they are related in the network because they are neighbours. This is a fragile connection because their daily interactions are unknown and if one moves away there is no longer a land-based relationship. The next relationship between Þorsteinn and Flosi is another land-based relationship where Þorsteinn claimed land in the region with Flosi's approval (S358). Again, this connection is shaky because there is an initial relationship and power differential, but over time there is no way to determine their level of interaction. The next step in the path is the relationship between Flosi and his uncle Loptr, thus the genealogy is going backwards in time (S368). Finally, Loptr and Brandr are connected, but it is unclear what their direct relationship is other than Loptr is his ancestor, *Frá Lopti er mart stórmenni komit, Þorlákr enn helgi, Páll ok Brandr* 'from Loptr, many great men are descended, Þórlakr *enn helgi*, Páll, and Brandr' (ibid.). The long edge between Loptr and Brandr in Figure 112, points to there being some distance in

their consanguineal connection because Brandr is more closely linked to his father, Sæmundr.

Although the blue path on Figure 112 is the shortest path and demonstrates that an all-male connection can be made between Bjǫrn and Brandr, it is not credible from a genealogical perspective. Non-consanguineal and non-affinal bonds are needed to create a connection between these two men. If the text and network were male-only, Bjǫrn and Brandr's textual relationship would be hard to prove because land-based connections likely would not have factored into genealogical matters. The inclusion of Hallveig, Þórunn, and Guðrún ensure there is an unbroken line of descent from Bjǫrn to Brandr. This only can occur because the female linkages do not diminish the overall prestige of the genealogy because Icelandic kinship was traced bilaterally when it proved to be convenient (Miller 1990, 143; Clunies Ross 1998, 88). If a woman, or series of women, helped link an individual to a certain ancestor, genealogies could easily be redrawn to make the desired connection (ibid.). The bonds between Hallveig, Þórunn, and Guðrún could have been deemed more important than the equivalent male relationships or they were used to fill gaps in the ancestry. Alternatively, the women could have been made up to make the desired link between these men. Regardless of the actual reason why Hallveig, Þórunn, and Guðrún were included in *S*, they directly connect the settler Bjǫrn to the Bishop Brandr and eliminate the need to reach for less desirable male relatives.

6.6.1.b Sturla Þórðarson and women

Sturla Þórðarson, the compiler of *S*, leveraged historical mother-daughter relationships in the genealogies of the *Sturlungar* 'Sturlungs', his kin group, to re-establish the political and social dominance of his family after the *Sturlungaöld* 'Age of the Sturlungs' (c.1220-64) and annexation of Iceland by Norway (c.1262-1264).[147] In 1241, king Hákon of Norway ordered the execution of Sturla's uncle, Snorri Sturluson. Then in 1268, the Sturlung's

[147] For overview of the *Sturlungaöld* see Gunnar Karlsson (2000b, 79-86). See also Bampi (2013, 61-2) for observations on literary production after the *Sturlungaöld*, Bampi's analysis is focused on saga literature, not *Ldn*, but *Ldn* can be considered a part of this literary polysystem..

chief political rival, Earl Gissur Þorvaldsson, died. These socio-political factors gave Sturla motivation to realign his family with the Norwegian crown (Gísli Sigurðsson 2014, 180).

To achieve this goal, Sturla used women to link his 'contemporary famil[y] to politically and culturally important ancestors' such as Hrollaugr Rǫgnvaldsson and the alleged son of King Haraldr *hárfagri*, Þórðr Vikingsson (S140, S305, S310; Long 2017a, 61-2). He reinterpreted past relationships to make genealogies 'fit with the factual circumstances in his own time' (ibid). To demonstrate how he strung together mother-daughter relationships in *S* to connect desired ancestors to contemporary kin S305 is used as an example:

> *Bǫðvarr enn hvíti var son Þorleifs miðlungs, Bǫðvarssonar snæþrimu, Þorleifssonar hvalaskúfs, Ánssonar, Arnarsonar hyrnu konungs, Þórissonar konungs, Svína-Bǫðvarssonar, Kaunssonar konungs, Sǫgasonar konungs, Hrólfssonar ór Bergi, ok Brand-Qnundr frændi hans fóru af Vǫrs til Íslands ok komu í Álptafjǫrð enn syðra. Bǫðvarr nam land inn frá Leiruvági, dali þá alla, er þar liggja, ok út ǫðrum megin til Múla ok bjó at Hofi; hann reisti þar hof mikit. Sonr Bǫðvars var Þorsteinn, er átti Þórdísi dóttur Qzurar keiliselgs Hrollaugssonar. Þeira son var Síðu-Hallr; hann átti Jóreiði Þiðrandadóttur, ok er þaðan mikil ætt komin. Son þeira var Þorsteinn, faðir Ámunda, fǫður Guðrúnar, móður Þórdísar, móður Helgu, móður Guðnýjar, móður Sturlusona.`
>
> (S305)
>
> Bǫðvarr *enn hvíti* was the son of Þorleifr *miðlungr*, son of Bǫðvarr *snæþrima*, Þorleifr *hvalaskúfr*, son of Án, son of King Qrn *hyrna*, son of King Þórir, son of Svína-Bǫðvarr, son of King Kaun, son of King Sǫlgi, son of Hrólfr of Berg. Bǫðvarr and his kinsman Brand-Qnundr went from Vǫrs to Iceland and came into south Álftafjǫrðr. Bǫðvarr claimed land inland from Leiruvágr in the whole valley and the other side of Múli and lived at Hof; he raised a great temple there. The son of Bǫðvarr was Þorsteinn, who married Þórdís daughter of Qzurr *keiliselgr* son of Hrollaugr. Their son was Síðu-Hallr; he married Jóreiðr daughter of Þiðrandi, and many people come from them. Their son was Þorsteinn, father of Ámundi, father of Guðrún, mother of Þórdís, mother of Helga, mother of Guðný, mother of the Sturlusons.

The genealogy of the land-claimant Bǫðvarr *enn hvíti* starts as a *langfeðgatal* 'a tale or roll of *langfeðgar* "agnate-forefathers, ancestors by the father's side, counted upwards"', in other words a purely agnatic line (Úlfar

Bragason 2018, 744; ONP). *Langfeðgatal* are rare and are mainly 'relate to royal houses or families that held other kinds of high office'—inheritable positions of power (Clunies Ross 1993, 378; see also Meulengracht Sørensen 1993, 26; Clunies Ross 1998, 89). Therefore, it appears that the genealogy was deliberately arranged so that Sturla could emphasise the royal ancestry and Norwegian heritage of the Sturlusynir. However, once Bǫðvarr arrives in Iceland, Sturla starts using mother-daughter pairings in the genealogy to make the desired connection between the settler and the Sturlusynir.

This conscious genealogical manoeuvring can be seen in Figure 113, a visualisation of the genealogy from S305. On the right side of the graph, there is a straight, purely agentic line emulating a *langfeðgatal*. To the left of Boðvarr's node the genealogy becomes more flexible and female-female relationships appear in the graph.

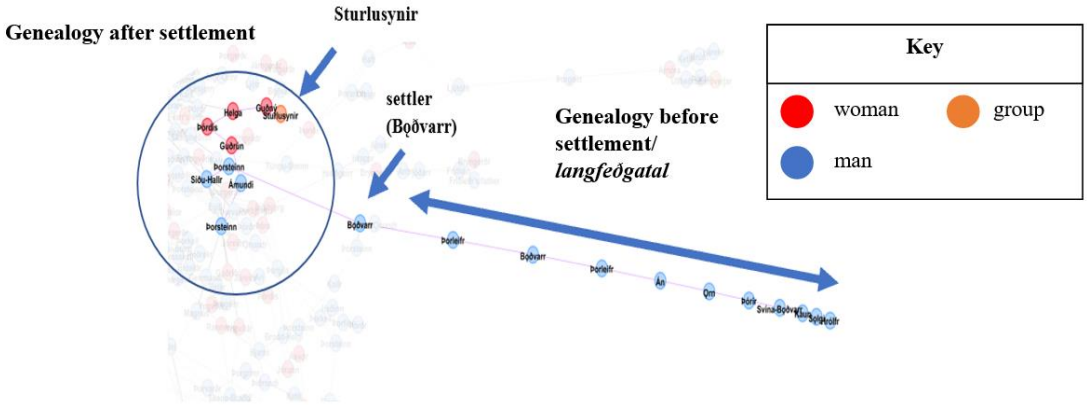


Figure 113 Genealogy from chapter S305 in narrative network

In a sense, Sturla is getting the best of both worlds. He conforms to agnatic line before Bǫðvarr arrives in Iceland, which legitimises Sturlusynir claims to Norwegian royal ancestry, but when he physically arrives more pliable genealogical conventions are used to make the desired contemporary connection. It could be that this is not an example of a partial *langfeðgar* in Iceland, but simply a genealogy recorded based on what information Sturla knew. However, evidence points to the former because medieval Icelanders knew how to construct *langfeðgar*. For example, Ari ends *Íslb* with his personal agnatic list: *Þessi eru nǫfn langfeðga Ynglinga ok Breiðfirðinga*, 'These are the names of the male ancestors of the Ynglings and the people of

Breiðafjǫrðr' (*Íslb Ættartala*; BoI 14). Furthermore, there is more evidence that suggests that Sturla carefully employs women in genealogies he takes personal interest in.

Sturla also used women to historically connect the Sturlusynir and their allies to the Norwegian King Haraldr *enn hárfagri*. Sturla begins this process with the wife of Jarl Rǫgnvaldr *á Mœri* 'of Møre [Norway]', Ragnhildr, daughter of Hrólfr *nefja*. After a short agentic lineage introducing her husband, she is the first women referenced in chapter S309, *Rǫgnvaldr jarl á Mœri, son Eysteins glumru Ívarssonar Upplendingajarls, Hálfdanarsonar ens gamla; Rǫgnvaldr átti Ragnhildi, dóttur Hrólfs nefju* (S309). Although her addition breaks the *langfeðgatal*, her inclusion is necessary to create more links to King Haraldr and establish which of Rǫgnvaldr's sons are legitimate.

According to *S*, she had three children with Rǫgnvaldr—Ívarr, Gǫngu-Hrólfr, and Þórir *jarl þegjandi*—all of which can be linked to King Haraldr. Ívarr fell in battle fighting for the king in the Hebrides. In *S*, Gǫngu-Hrólfr is presented as the conqueror of Normandy and as the progenitor of both the jarls of Rouen and kings of England. Their third son, Þórir, arguably has the strongest connection to King Haraldr of the three in *S* because of his wife. Þórir married Álǫf *árbót*, the daughter of King Haraldr. Together they had a daughter named Bergljót, who was the mother of Jarl Hákon *enn ríki* (c.975-95).

Sturla sets up S309 like he is going to follow traditional agnatic principle, however, he selectively inserts women—Ragnhildr, Álǫf, and Bergljót—to increase the perceived status of the lineage which is only tangentially related to his own to achieve his contemporary goals. This is demonstrated by Ivarr and Hrólfr's wives not being mentioned—if they even had them. Furthermore, Rǫgnvaldr had three illegitimate sons: Hrollaugr, Einarr, and Hallaðr, with unnamed 'implied' women. The only information known about the mothers is when Rǫgnvaldr emphasises that Einarr's mother was descended from enslaved people on both sides, *því at móðurætt þín er ǫll þrællborin*. This contextualises the distain that Rǫgnvaldr has for Einarr, prompting this son to go to Orkney. In the cases of Hallaðr and Hrollaugr, the names and status of their mothers could have been unrecorded to obfuscate any

unsavoury ancestry on their mother's side. Additionally, it could be argued that Hrollaugr has a purely agnatic lineage in *S* because his mother is unknown, and the other women inserted before his settlement in Iceland are not consanguineously related to him but are inserted to build the historical connections between the groups.

Of all the legitimate and illegitimate sons of Rǫgnvaldr, Hrollaugr establishes the strongest, longest-lasting relationships with King Haraldr. Although he has no direct consanguineous or affinal ties with the king, their friendship is expressed through several actions in *S*. First Hrollaugr stays with King Haraldr in Norway after being rejected for the Orkney jarldom. Next Hrollaugr emigrates to Iceland with the king's approval (S310). This is one of the rare instances in *S* where a non-Icelander grants approval for an individual to settle in Iceland.[148] This act works at two levels, providing context for why the Sturlungar reside in Iceland and not in Norway as well as establishing Norway's authority over the kin group and that they follow the leaders will. Although Hrollaugr and Haraldr never physically meet again, it is said that they remain friends the rest of their lives. Additionally, Hrollaugr is sent a horn, sword, and gold ring by Haraldr and these objects were all verified to exist by witnesses one of which being Kolskeggr *enn vitri* (see IV).

The Sturlusynir are connected to Haraldr via his friendship with Hrollaugr, but to prove the Sturlusynir's direct descent from Hrollaugr, multiple women are inserted into the Sturlusynir's genealogy. Figure 114 shows how the Sturlusynir are linked to King Haraldr in the narrative network. The red line symbolises the path—between the Sturlusynir and the rightmost and Haraldr. It takes ten steps to make the desired connection between these two. Of these steps, three are exclusively female mother-daughter dyads: Guðlaug to Þorgerðr, Þorgerðr to Járngerðr, and Járngerðr to Valgerðr. These women are integral to Sturla's contemporary plans because if he only chose ancestors from his patrilineal line, the association between the Sturlusynir and Hrollaugr/royalty would be weaker.

[148] King Haraldr also encouraged Ingimundr *enn gamli* to settle in Iceland (S179).

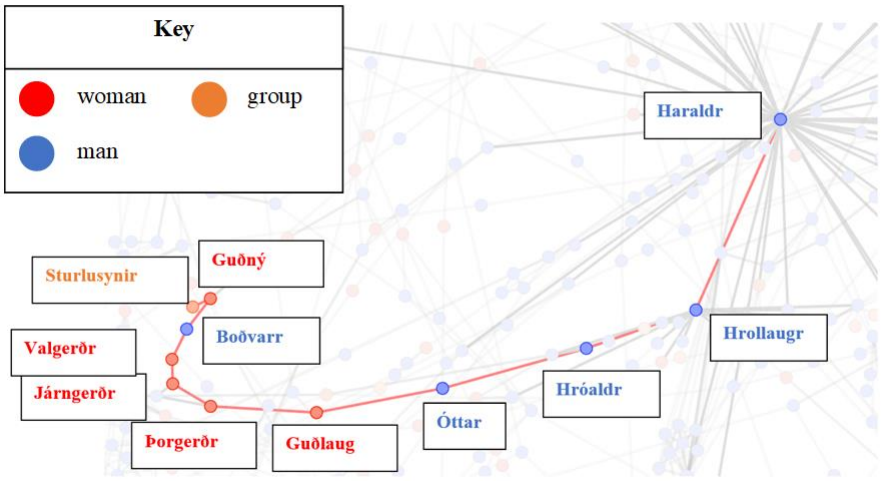


Figure 114 Ten-step path from King Haraldr to the Sturlusynir via Hrollaugr

6.6.2 Inclusive Genealogical Patterns

In the 'inclusive' pattern women are inserted into genealogies as settlers, wives, daughters, mothers, and sisters to provide as much information about the land-claimant and their descendants as possible. This technique is especially useful in cases where the male relatives were unknown, did not exist, or were simply less prominent members of the kin group. Thus, the addition of women in genealogies increase the potential number of ancestors that contemporary descendants can claim ancestry from. In this model there are also more opportunities for women to form familial interactions like mother-daughter and sister-sister dyads. Sister-sister dyads facilitate horizontal movement within the narrative network because they create opportunities for individuals to have connections with in-laws, nephews, or nieces even if these relationships are rarely explicit in *S.*

For example, Ketill *aurriði*'s genealogy ends with the sisters Oddný and Ásborg who are both married to powerful men, Eilífr *ungi* and Þorsteinn *goði* respectively (S361).[149] Oddný and Ásborg's bond serves multiple purposes: to bolster Ketill *aurriði*'s lineage, legitimize present day descendants, and create connections between their husbands that would be non-

[149] It is assumed that Oddný and Ásborg are sisters because they share the same father Oddr *enn mjóvi*. Their mother is not mentioned in the text, so in the database they are labelled as 'at_least_half-sisters', but for simplicity they are referred to as sisters in the analysis.

existent if they were not sisters. Although it appears that Ketill *aurriði*'s genealogy ends in S361, it is extended and strengthened through these women in other chapters of *S* where he is not explicitly mentioned. Ásborg's and Oddný's lineages will first be discussed separately to highlight how two powerful branches unite through their sisterhood.

6.6.2.a Ásborg

Ásborg and her husband Þorsteinn *goði*'s lineage culminates with Markús, who was *lǫgsǫgumaðr* 'lawspeaker' at the Alþingi from 1084-1107 (S355; Burrows 2009, 220).[150] Ásborg is the conduit in through which Markús' contemporary and future descendants can claim lineage from multiple *landnámsmenn* and former law-speakers. Via Ásborg's father, Oddr *enn mjóvi*, Markús can trace matrilineally to the settler Hrólfr *rauðskeggr*. He is also related to two of the earliest lawspeakers of Iceland, Þorkell *máni* (970–984) and Þorgeirr *at Ljósavatni* (985–1001). However, the connection to these prominent men is only possible through more sister-sister relationships.

Þorkell *máni*'s mother, Þóra, and Þorgeirr *at Ljósavatni*'s maternal grandmother, Æsa, were the sisters of Helga, the mother of Oddr *enn mjóvi* and grandmother of Ásborg, who in turn is the great-grandmother of Markús. Here sister-sister dyads enable Markús' contemporary descendants to move horizontally through genealogies to reach desired ancestors. This can be seen in Figure 115 which shows how Þorkell *máni* and Þorgeirr *at Ljósavatni* can be linked to Markús in the network of *S.* It only takes eight steps for Markús to be connected to Þorgeirr in the network (blue path) with the key relationship being the sister-sister relationship between Æsa and Helga that enables a lateral genealogical move. Helga is then a direct ancestor of Markús, thus linear and inclusive connections are used to link the lawspeakers.

[150] Dates for lawspeakers from ÍFI (xxxviii-xxxix). For a biography of Markús and his references in other texts see Burrows (2009, 220-2). She makes similar connections between Markús and ancestors in *Ldn*; however, she does not discuss the roles of his female relatives.

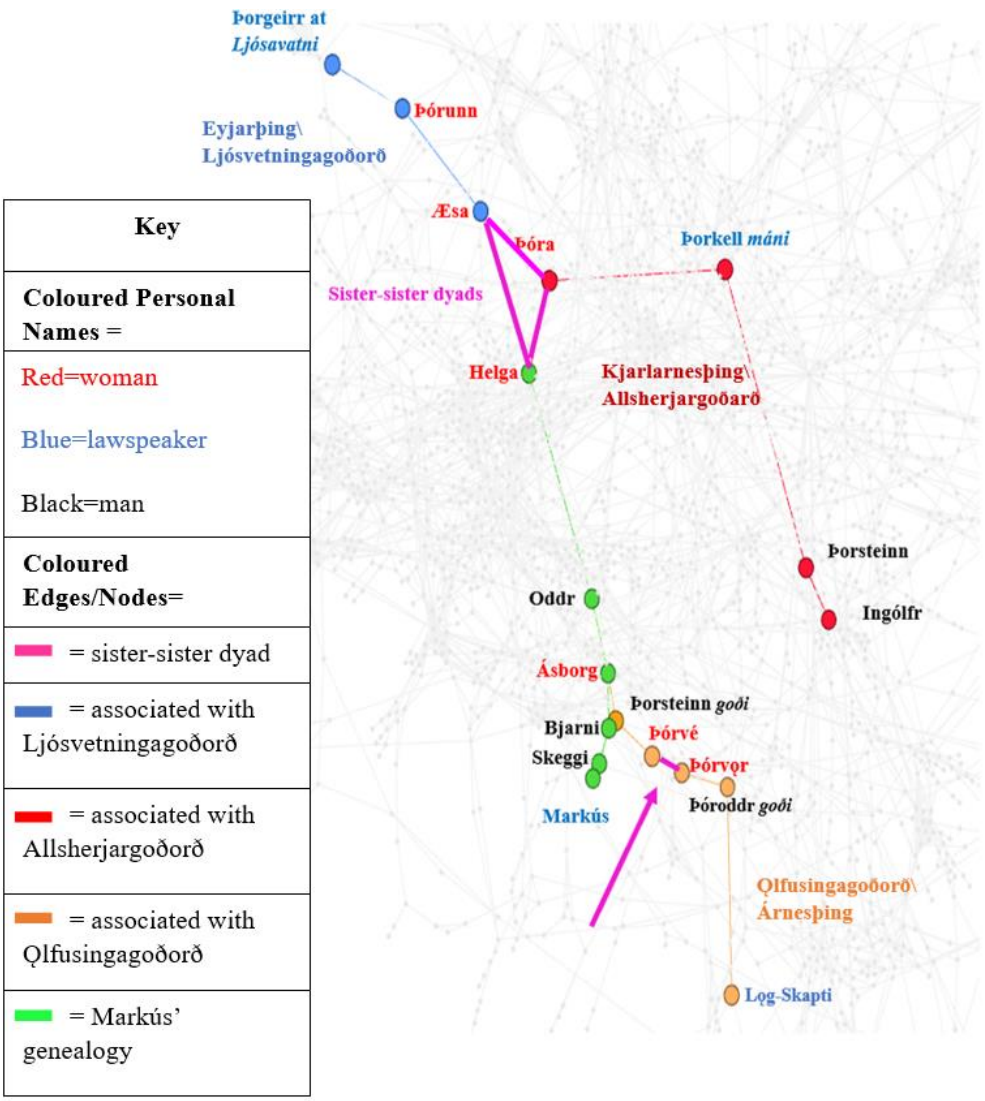


Figure 115 Markús' lineage visualised in the network

It takes fewer steps—seven—for Markús to reach Þorkell *máni* in the network because he can ascend his maternal lineage and then make a lateral move via the sister-sister dyad of Þóra and Helga to reach Þorkell *máni*. Markús can also claim descent from Ingólfr using this path because Þorkell *mani* is the son of Þorsteinn, the son of Ingólfr (S9). Curiously, Þóra and Þorsteinn are never explicitly mentioned together as husband-wife (let alone co-appear) in any chapter in *S.* If she was not mentioned in *S*, it would not be possible to link Markús to Ingólfr using only explicit consanguineous and affinal relationship in the network. Therefore, her presence is necessary to establish an unquestioned lineage. Yet this group of sisters is not the only sister-sister dyad that Markús' descendants can call upon to legitimise their social standing.

Ásborg's marriage to Þorsteinn *goði*, also allows Markús to claim descent from the famous Norwegian Ǫlvir *barnakarl* and the settler Þormóðr *skapti*, whose ancestry includes more legislative and judiciary leaders (S355, S379).[151] To establish lineage with these individuals, Markús and his descendants made use of another sister-sister dyad. The daughters of Þormóðr *skapti,* Þórvǫr and Þórvé, both gave birth to *goðar* 'chieftains' (S355, S379). Þórvǫr's son was Þóroddr *goði* who was the father of Lǫg-Skapti, lawspeaker from 1004-30 (S379). As mentioned, Þórvé's son, Þorsteinn *goði* marries Ásborg. Although she is not referenced alongside her husband in chapter S355, their son Bjarni *enn spaki* is recorded again. Therefore, through Þórvé and Þórvǫr's relationship, Lǫg-Skapti and Markús can be connected to each other.

These examples illustrate the power of sister-sister relationships especially those of the triad of Æsa, Þóra, and Helga and the pairing of Þórvǫr and Þórvé. They provide Markús' descendants evidence to show that they came from an 'old and respected family, with particular strengths in wisdom and the law- areas of skill and knowledge that might readily be expected to be transmitted within the kin group' (Burrows 2009, 221; see also Clunies Ross 1998, 87). The transmission of bynames like *Lǫg* 'law' and *enn spaki* 'the wise' and designations of status like *goði* attached to an ancestor's personal names denoted Markús' identity as a member of the elite because he would likely reflect these familial traits (Whaley 1993, 125-6). Markús seems to inherit these legal and historical skills because he was a lawspeaker in his own right and also served as the informant on lawspeakers for *Íslb* (*Íslb* 10; Carroll 2009, 292). Yet Markus' and his descendants are only able to legitimise their social standing because in the medieval Icelandic genealogical system there is nothing 'that prevents the transmission of masculine virtues through females to a male descendant' (Miller 1990, 143). Of course, it is impossible to know how the sisters interacted or even if they liked each other; however, this does not impact their function as connectors in the network where only their relationship is needed. This ambiguity allows ancestors to assign their own interpretations and build their own narratives about these connections for their own benefit.

[151] Þorsteinn *goði*'s paternal ancestry is uncertain. It has been speculated that he might be the son of Porkell *máni*; however, this cannot be proved (S355n2; Einar Arnórsson 1950, 186-7).

The inclusion of these sister-sister relationships also creates historical connections between three of the most powerful family groups in medieval Iceland, which in turn. Each of these families is associated with a *goðorð* ‘a domain of a *goði*’ and a regional *þing* ‘assembly’ site. The first kin group is comprised of Ingólfr, Þorsteinn, and Þorkell *máni*, who are associated with the *Allsherjargoðorð* ‘All-people chieftaincy’ of the Kjarlarnesþing in the Southern Quarter of Iceland (Gunnar Karlsson 2004, 230). Their nodes and relationships are shown in red in Figure 115 and the location of these sites is indicated by the red label and arrow in Figure 116.

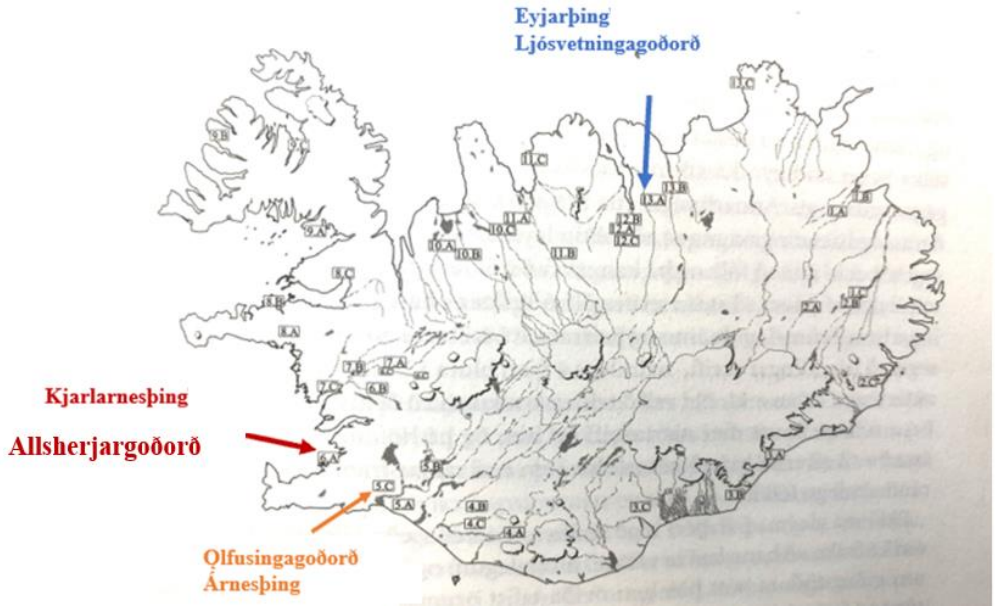


Figure 116 Map showing goðorð locations (Gunnar Karlsson 2004, 269; after Lúðvík Ingvarsson)

Also in the Southern Quarter is the neighbouring *Ǫlfusingagoðorð* of the Árnesþing, this group is comprised of Lǫg-Skapti, Þóroddr *goði*, and Þorsteinn *goði*. It could also be assumed that Þórvé and Þórvǫr were associated with this group at some point based on their relationships with these men. Speaking to the power of this family, the *Ǫlfusingakyn* ‘kin of Ǫlfus’ is also one of the two independent genealogies cited in *S* and thought to date from the early twelfth century (S334; Úlfar Bragason 2018, 745; see 1.3.2.c). The nodes and relationships of individuals connected to the Ǫlfusingagoðorð/Árnesþing are coloured orange in Figure 115. The location of the

Ǫlfusingagoðorð/Árnesþing is denoted by the orange label and arrow in Figure 116.

The third *goðorð*, Ljósvetningagoðorð of the Eyjarþing in the Northern Quarter was formed c.965, when the country was divided into Quarters and the *goðorð* system was formalised. The first *goði* was Þorgeirr who is often styled as *goði at Ljósavatni* (Gunnar Karlsson 2004, 262, 262n3; Lúðvík Ingvarsson 1987, 558-83). The blue nodes and edges in Figure 115 represent people and relationships associated with the Ljósvetningagoðorð/ Eyjarþing. The location of Ljósvetningagoðorð/Eyjarþing is indicated by the blue label and arrow in Figure 116.

The Ljósvetningagoðorð group (blue nodes and edges) is visually more distant from Markús in Figure 115 than the Allsherjargoðorð (red nodes and edges) and Ǫlfusingagoðorð (orange nodes and edges) groups because overtime these lineages veer in separate geographical directions creating new regional subnetworks. This is partially attributed to Æsa's descendants like Þórðr maintaining and forming relationships in the Northern Quarter of Iceland (see 3.41 and 3.4.2). Since the Allsherjargoðorð and Ǫlfusingagoðorð are both based in the South their sub-networks are more likely to overlap. Nevertheless, these groups could revive their shared historical relationships if they needed to be used in contemporary times for a land-claim or another socio-political matter.

6.6.2.b Oddný

After the husband-wife relationship between Ásborg and Þorsteinn *goði* is mentioned in S355*,* the lineage becomes exclusively male. Her sister, Oddný's genealogy includes a female descendant in each subsequent generation after her marriage, *Eilífr ungi, er átti Oddnýju, dóttur Odds ens mjóva; þeira dóttir var Þuríðr, er átti Þorgeirr í Odda; þeira dóttir var Helga* 'Eilífr *ungi*, who married Oddný, the daughter of Oddr *enn mjóvi*; their daughter was Þuríðr, who married Þorgeirr of Oddi; their daughter was Helga' (S352). Oddný's husband, *Eilífr enn ungi* is the son of Eilífr, a *landnámsmaðr*, who came from Sogn, Norway and took possession of Oddi *enn litla* up to Reyðarvatn and Víkslœkjar (ibid.). Since no male heir of Eilífr *enn ungi* is mentioned in *S* it is a

possible that his daughter, Þuríðr, inherited her family's claim because she is their only child referenced in *S*.

In medieval Iceland, women could inherit property if their fathers produced no male heirs (*Grágás* 47-8). When Þuríðr marries Þorgeirr of Oddi, a *landnámsmaðr* in his own right, she not only brings the value of her lineage, but potentially the asset of her family's land and wealth that would be presumably larger than a dowry. If this is indeed the case, then the marriage would have consolidated the two bordering *landnám* of the families and further concentrated power within the area. Figure 117 shows the land claims of Þorgeirr and Eilífr—the father of Eilífr *enn ungi*. The combined genealogies of the couple would have likely given them the authority to make this transaction because they can call upon their *landnámsmaðr* and Norwegian heritage to demonstrate that they are legitimate owners of these land-claims. Furthermore, Þorgeirr can also draw upon his ancestor Úlfr *gylðir*, who was a *hersir ríkr á Þelamǫrk* 'a powerful chieftain from Telemark', to demonstrate that not only has he ancestral ties to Norway but comes from the ruling class (S356-S357).



Figure 117 Map showing approximate locations of Eilífr and Þorgeirr's land-claims (ÍF I)

Þorgeirr of Oddi and Þuríðr also only have one child mentioned in *S*, a daughter, named Helga. Since no other children are discussed, she could have been the sole inheritor of her father's properties and/or held some relative power. Furthermore, her personal name harkens back to Oddný's grandmother, and her namesake, Helga, which could have been a way to call attention to this

branch of her genealogy. The elder Helga was the daughter of the *landnámsmaðr*, Hrólfr *rauðskeggr* so at minimum three genealogies of *landnámsmenn* converge in the younger Helga—Eilífr, Þorgeirr, and Hrólfr. Therefore, in lieu of a male, she could function as a legitimate descendant for all three family lines if a contemporary need arose. Thus, the insertion of Helga as the final person in a genealogy is important (whether she was a historical figure or created to fill a gap) because it is harder to claim direct descent from a woman. For a person to claim a woman as their mother, they need to be born of her. So, inserting Helga (or any woman) at the end of a genealogy is not just an effective way of ensuring only her direct descendants can claim descent, but it also disqualifies people with more tenuous thirteenth-century patrilineal ties to link themselves to these families.

To terminate the genealogy in this fashion does seem like a purposeful act by Sturla because in the corollary chapter H314, Helga's husband and children are mentioned, *Helga, er átti Svartr Úlfsson, þeira son Loðmundr í Odda, faðir Sigfúss prests fǫður Sæmundar hins fróða* 'Helga, who married Svartr son of Úlfr, their son was Loðmundr of Oddi, father of Sigfúss *prestr*, father of Sæmundr *hins fróði*' (H314). If Helga's husband and children were recorded in *S*, patrilineal nomenclature (e.g. patronymics) and patrilineal bias would lessen the narrative impact of her direct links to these ancestors (Jochens 1995, 30). Furthermore, Sturla would have been privy to this information because he was familiar with Sæmundr's work. Sturla cited Sæmundr as a source for the Naddoddr's exploratory trip to Iceland, and he was versed in Sæmundr's genealogy, mentioning him in three lineages (S188, S310, S359; see 3.6.2). Therefore, it appears that Sturla was motivated by an underlying socio-political reason that is not clear at present. Nevertheless, this example has demonstrated that genealogies which terminate with a woman should be reevaluated because this is likely a conscious narratological decision.

6.6.2.c Ásborg and Oddný

The sister-sister relationship between Ásborg and Oddný is also important because it acts as a bridge between individuals that otherwise have no connection in the narrative network, despite being neighbours on the physical

landscape, see Figure 118. Ketill *aurriði*, Ásborg and Oddný's father, does not have any direct relationship with their respective husbands, Þorsteinn *goði* and Eilífr *enn ungi*, in *S*. Additionally, Þorsteinn *goði* and Eilífr *enn ungi* are not related in any way in the text, therefore, to get in contact with each other they need to make use of their wives' connection as sisters. For example, in Figure 119 for Þorsteinn to reach Eilífr in the narrative network, he needs to make use of a path that includes his wife and sister-in-law.

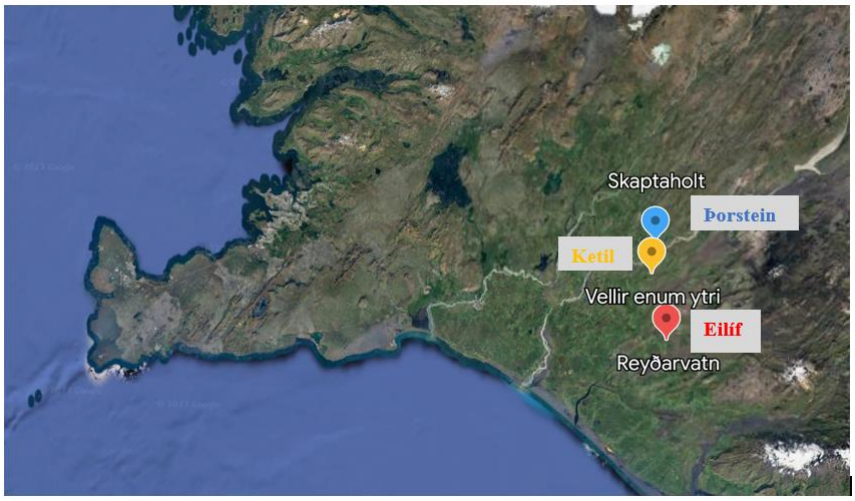


Figure 118 Map of farms associated with Þorsteinn, Ketill, and Eilífr

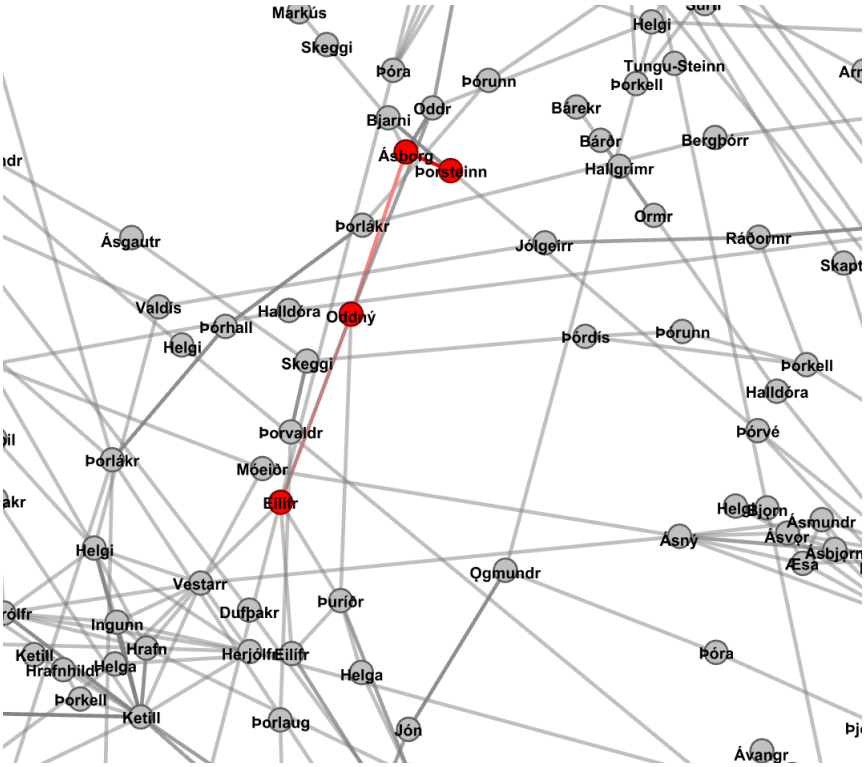


Figure 119 Path from Eilífr to Þorsteinn in narrative network

Oddný's creates a bridge between her husband's kin and her sister's, pulling them closer together enabling the brothers-in-laws who are not related in the text to access each other in the narrative network (see 2.2.1.a). This pattern suggests that Eilífr *enn ungi* and Þorsteinn *goði*'s and/or their families were either in contact or at least aware of each other at some point during the *landnám*, or that they wanted to create a historical connection to project their contemporary bonds. Although their relationship was not considered strong enough to be explicitly preserved in *S*, the relative proximity of these two kin groups in the network, their connection to one of the sisters, and the closeness of their land-claims indicate that they were operating in the same social circles. This example demonstrates how examining the confirmed relationships in the network like Ásborg and Oddný's can uncover potential relationships between kin groups in the narrative that are implicit in *S*, thereby shedding more light on how the settlement society was perceived and/or manipulated in the thirteenth century.

6.7 Conclusion: A Social Network Analysis of the Women of Sturlubók

Chapter VI looks at how women operate in the narrative network of *S*. Their nodes are evenly distributed throughout the network graphs (see Figures 91 and 93). This shows that they were perceived as being integrated into settlement society. Furthermore, the absence of large same-gender groups in the network, indicates that gender was not a main category used to organise *S* and other factors like geography and social status were more important in determining whether an individual was recorded. For example, Auðr is not included in the text or network just because she is a woman. She establishes a regional hierarchy by expertly leveraging her political position as a settler and making marital arrangements. Since being a settler and making marital arrangements are not gender-exclusive activities—just uncommon for women, and Auðr had to meet certain conditions to enter these roles (being widowed)—Auðr can be perceived as one of the most powerful individuals in Iceland, regardless of gender. This is evidenced her high rankings across all centrality measures (see 5.5).

When women are removed from the narrative network, network graphs become less dense, more fragmented, and act less like small-world networks. This demonstrates women's ability to connect men and families that would otherwise have no relationships in *S*. On the other hand, when men are removed from the narrative network and only the women's nodes remain, the network collapses (see 6.3.2). This is because woman-woman relationships in the narrative network are near exclusively formed between women from the same consanguineous kin group. This is partially explained by the fewer opportunities that women have in the text to engage with other women because they are not often in roles like *landnámsmaðr*, which provide access to more types of non-kin relationships like land transactions.

Overall, women are integral to the network structure because they facilitate geo-political connections between neighbouring farms through marriage and movement. This helps imbue *S* with its characteristic sense of verisimilitude, because the network emulates more 'real-world' structures.

In individual genealogies the insertion of a woman extends the genealogy, allowing the compiler to reach a desired descendant—usually a man. Additionally, the more women that are included within a family's lineage increases the potential number of connections her descendants have in the narrative network, and ancestors that her contemporary descendant can claim lineage from, because gender does not prevent individuals from inheriting virtues or land—with the caveat that certain conditions are met. Ultimately, investigating all 706 women in the network has shown that although they are not as well documented as men and many do not appear as *landnámsmenn*, they are appearing in almost every part of the narrative network, showing that they were perceived as fundamental parts of society even if they are not always explicitly mentioned.

VII Conclusion

This conclusion will present the main findings from the previous chapters and discuss future opportunities for research.

This thesis applies an interdisciplinary approach combining traditional historical and literary methods with SNA and VA to construct, visualise, quantify, and analyse the narrative networks (i.e. people and their relationships) of the *S* redaction of *Ldn*. Visualising, manipulating, and investigating these network graphs comprised of approximately 3,100 individuals and their 8,100 relationships enhances *Ldn* scholarship by moving away from genealogical models confined to individual family groups, to a quantitative large-scale investigation of all relationships—familial, affinal, geographical—in *S.* This novel methodology facilitates the measurement of these relationships, providing *quantitative* analysis from *qualitative* data to reevaluate the historicity of *S* and how to use it as a historical source. Furthermore, it detects emerging patterns of migration, settlement, and community formation in the narrative network which provide new insights into how thirteenth-century Icelanders perceived the *landnám.*

Overall, the thesis' findings demonstrate the 'crafted complexity' of *S* (Ranković 2006a). The reconstructed narrative networks are not only complex in the sense that they emulate many features of 'small-world' and 'real-world' social networks, but these sociograms also emerge from a tradition of oral storytellers and scribes, at a specific time, and distributed over centuries (see 6.4). These networks are multidimensional, multimodal, and diachronic developing from 'real' historical events and people, which are transformed over time in oral and written traditions, while simultaneously existing in conceptual frameworks of cultural memory. Thus, networks in *S* are inherently paradoxical because they are 'localised' to this specific text and its period of compilation (c.1275-1280) and influenced by Sturla Þórðarson; but they cannot be fully untangled from the overarching system (i.e. tradition in general, any other redaction of *S*, the actual *landnámsöld*). This is because the *landnám* 'was not simply a memory of that distant past, whether accurate or constructed, but a product of those ongoing relationships long after the Viking Age, which

maintained and encouraged a sense of commonality and belonging in the present, based on a shared past', which can also speak to the future (Jesch 2015, 64).

This shared past originates from collective memories of migration. These memories are anchored to the *landnámsöld* (c.870-930) and conceptually link the homelands of Scandinavia and the British Isles to Iceland. However, these are not one-way spatial and temporal relationships, instead they represent lines of continued communication between locations and individuals across time in a diasporic network. The places, people, and time periods are fixed in memory, but varying narratives can be created around these constants (see 4.2, 4.3 and 5.3.1.c.iii). This is evidenced by King Haraldr *enn hárfagri* being in the middle of *S*'s narrative networks and ranking highly across all centrality measures (see 5.5 esp. 5.5.2.a.i). His predominantly negative portrayal as an unjust, tyrannical king during the *landnámsöld* serves both as a temporal marker and catalyst of migration. The emigration of nobles and *hersirs* from Norway is justified through his actions. Their past status as members of the ruling class legitimises the formation of a new society during his reign. He is not only a historical figure, but a narratological device around whom *landnámsmenn* and their descendants could reconfigure their origins as Icelanders at any point in time (see 3.6.2 and 5.5.2.a.ii). Haraldr as a figure of memory was a foil onto which thirteenth-century Icelanders could project their socio-political and constitutional concerns while Norway was gaining more control in their present. Nevertheless, there may have been truth to Haraldr's tyranny that could have been built upon.

Of course, not all settlers were from Norway, and many were from or had a strong connection to the British Isles, but the origin of many others is unknown. There are various reasons one might have migrated to Iceland not just because of a despotic leader, and Haraldr was even seen as a patron and friend to some of the settlers (see 5.3.1.c.ii and 5.5.5.a.ii). In these *landnám* narratives the past is viewed through a contemporary lens. For example, *landnámsmenn* throw their *ǫndvegissúlur* 'high-seat pillars' overboard to ask for guidance on where to settle in Iceland like Ingólfr. In this case, Ingólfr is

projected as a ‘noble heathen’ for Icelanders to reconcile their pagan past with Christian present, but there was likely some vestige in truth that he wintered in multiple locations before finally settling in Reykjavík (see 4.3 esp. 4.3.1). These examples demonstrate that the act of migrating between two fixed points—the homelands and Iceland—creates a separation between the past and present and the sea itself becomes a narrative space in which origins can be recrafted to suit the present (see 5.2.1.a).

Past networks and relationships are invoked to contextualise the present in medieval Iceland. However, these appeals have no cultural significance or political validity if the historical individuals, relationships, and networks—whether ‘real’ or ‘invented’—are part of an unrecognisable conceptual framework. That is for the textual society/narrative network in *S* to emulate medieval Icelandic society and appear authentic, relationships (consanguineal, affinal, etc.) in *S* need to comply with accepted relational models and textual locations need to correspond to their physical counterparts in the landscape. Thus, different pieces of settlement information i.e. land-claims from different regions, can be collected and compiled together because they make use of the same types of entities (e.g. individuals, relationships, locations) in a shared conceptual framework. This is evidenced by how Kolskeggr’s section, though stylistically different, seamlessly integrates into the overarching narrative network of *S* (see 4.2).

For Iceland and Icelanders to become distinct entities within this abstract structure, social and cultural interactions brought over from homelands (e.g. Scandinavia and the British Isles) had to be adapted to fit the virgin landscape of Iceland (see 5.3.1.b). Although distinct, these relationships still had to be recognised and understood not only by individuals in Iceland, but also by those who remained behind in the homelands so that Iceland could be perceived as a unique entity. The familiarity of these relationships served as a relational framework of reference for a burgeoning settlement society, which enabled Icelanders not only to enter, but eventually integrate into an overarching diasporic network. In *S*, *landnámsmenn* are the initiators of this transition from vacant island to a distinct society because they serve as bridges

between the homelands and Iceland, transporting relationships and social structures (see V). However, as soon as they set foot in Iceland, settlers' relationships began to change and pre-existing social structures were reorganised to meet their contemporary needs in a new context (see 5.2.1). Ultimately, this process facilitated the creation of a sense of Icelandicness.

Initially *landnámsmenn* attempted to maintain their pre-Icelandic relationships, partial networks from the homelands migrated over with *landnámsmenn* travelling together on the same ship (see 5.2.1.a). Upon arrival these shipmates would often try to settle near each other, or they would seek out family members who previously arrived and settle nearby. Overwintering is also frequently mentioned in *S*, which implies that settlers had knowledge of where to find a host, whom in many cases they knew pre-arrival i.e. a family member or friend) (see 5.2.1.c). However, not all these relationships adapted to their new geographical context and *landnámsmenn* and their immediate descendants quickly eschewed past relations if they were not located nearby (see 3.4.2 and 5.2.1.c). Thus, geography became the greatest source of homophily in the narrative networks and even amongst the first generation of *landnámsmenn* (see 3.4.1).

Landnámsmenn not only embedded themselves in the physical landscape, but also colonised the collective memory of the island through land-claiming and land-naming (see 3.6.1). These acts created the foundational relationship of Icelandic society, which is not between people, but between the *landnámsmaðr* and their land-claim. A settler and their boundaries functioned as a distinct, inseparable conceptual unit. Narratives could be crafted around a person situated in a place whether the person was 'real' or 'invented', or if boundaries were manipulated, because it was this person-place association who anchored memories to the past and present perceptions of the socio-political landscape. These spatial associations could be inherited through genealogies and can only be severed by a transactional event (e.g. land sale or marriage) where the land enters new ownership, which occurs more often as genealogies proliferate and combine with other families (see 5.3). Nevertheless, these lineages still must affix to a settler—or multiple settlers—and their land-claims

be recognised as part of the social network. If there is no relationship, whether historical or contemporary, an individual cannot fully be connected within the society, becoming a 'phantom' settler (see 4.4.1 and 5.6).

The networks of settlement that emerge in the *landnámsöld* as depicted in *S* reflect 'realistic' and 'small-world' community dynamics in part because people are figures of memory in recognisable locations in the Icelandic landscape (see 3.2 and 5.4). Descendants of the *landnámsmenn* can then interact within bounded conceptual spaces that correlate to different geographical layers: farm, land-claim, Quarter, the entire island, and then the diasporic world beyond the sea. Therefore, by constructing how these conceptual and narratives units 'converse' with each other, the visualisations and metrics produced with SNA and VA reveal how Icelandic society could have been organised in its earliest stages at the micro-, meso-, and macro-levels as perceived by the Icelanders themselves (see 3.4, 3.5, and 3.6).

The regional hierarchies that emerge in the narrative networks are centred around primary settlers such as Skalla-Grímr in Borgarfjǫrðr and Hrollaugr in the east, who created dependencies via gifting land, selling land, and giving others approval to settle in their claims (see 3.4 and 5.3.1.c.ii and 5.3.1.c.iii). These acts contributed to these individuals being recognised as outstanding settlers of their respective regions and becoming hubs in the narrative network (see 3.2.2 and 5.5.2.b). This hierarchy of settlement quickly stabilised and socio-political power was consolidated by leading regional families (who could trace to a prominent *landnámsmaðr*) merging through affinal ties, which in turn historically and culturally rooted specific kin groups in different areas of Iceland (see 6.5 esp. 6.5.1 and 6.6.2).

Women were integral in establishing this hierarchy because they function as bridges in regional networks, connecting families that would otherwise have no contact in the network but live near each other i.e. virilocal movement patterns (see 6.5.1 and 6.5.2 esp. 6.5.2.b). Although the numbers of women included in the network reflect a bilateral genealogical system that leans towards the patriarchal, matrilineal lines as just as important and occasionally favoured, if the genealogical narrative being crafted needs women

to make desired contemporary connections. Women are conceptualised as being a part of the same settlement and Commonwealth society as men. They are not treated as exceptional or inserted just because they are women, they are mentioned because they are part of the construction of an Icelandic society in the collective memory (see 6.2.1 and 6.4.4). For instance, Auðr *djúpauðga* is not 'exceptional' because she is a woman, instead she is important because of her role as one of the leading settlers in the west of Iceland, which her interactions with other settlers and women in her ego-network demonstrate (see 6.3.2). This does not mean that relationships and the insertion of males is not favoured when the opportunity arises. Auðr had to meet several conditions to obtain primary settler status, but the imbalance of the male to female ratio in the text can be in part explained by thirteenth-century socio-political norms and selection of detail, not because there are fewer women than men. This is evidenced by how evenly distributed the nodes of women are throughout the narrative network, despite being outnumbered by men, and that the network operates more like a 'small-world' network when women are included (see 6.2.1 and 6.4).

Therefore, even though gender is one of the factors that influence an individual's inclusion in *S*, it is not the primary factor. Instead, a person's socio-political status (i.e. if they are a settler, if they have dependant settlers) and their geographical location are better indicators of whether an individual is mentioned (see 3.4 and 5.3). Relationships between high-status individuals are more likely to be remembered than those between individuals who were not considered as politically or historically important. In both *landnám* and thirteenth-century Iceland, those in position of power were predominantly free men, but her gender did not exclude a woman from taking on an important societal role like Auðr or inheriting; it was just more uncommon or less evident in the sources (see 6.2.1.a).

Regional hierarchies became more entrenched after the settlement period (c.870-930) when Iceland was formally divided into the geo-administrative units called *fjórðungar* 'Quarters' (c.965 CE). Each of the Quarters (North, East, South, and West) were further subdivided into *goðorð*

that were controlled by *goðar*, who were often descendants of one or multiple *landnámsmenn* (see 6.6.2.a). The anachronistic use of Quarters as the main organisational units in *S* and their appearance as sub-communities in visualised narrative networks demonstrates that they are not viewed as chronologically separate from settlement, but as a natural evolution of Icelandic geo-administrative structure (see 3.2.2). This development is intertwined in the construction of a pan-Icelandic identity because division into Quarters implies that they are parts of a whole unit (see 3.1). This is visualised in network graphs where four distinct regions emerge, but they are still connected (see 3.3).

Thus, the sequence of socio-political development outlined in *S* begins with the foundational conceptual unit of a *landnámsmaðr* and their *landnám*. As *landnámsmenn* interact with neighbouring settlers, their families and descendants become physically and mentally associated with that region. These relationships lead to a construction of regional hierarchies, communities, and identities based on historical connections in a specific geographical location. Neighbouring regions then interact with each other forming larger geographical and conceptual units (i.e. Quarters) and eventually all of Iceland becomes paradoxically connected and partitioned. In other words, certain individuals and their families are recognised as being from the west or east, etc., but they are still Icelanders. Eventually, these communities and identities (both regional and pan-Icelandic) that emerged in the settlement period become formalised with the institution of Quarters, *Alþingi*, and legal system in the Commonwealth.

Establishing an internal, continuous hierarchy is one of the first steps in establishing sovereignty recognised by other sovereign entities (see 5.3.1.b). Iceland's self-governance came under internal threat at the local level during the *Sturlungaöld* as well as externally from Norway. So, there was pressure from local and international levels to establish ownership of individual land-claims and regions of lands for current Icelandic leaders who in turn were both trying to appease their constituents as well as Norway. In this way, *S* serves multiple purposes: it is a genealogical charter, a history, etc. It is therefore

reductive to assign it a singular purpose when multiple compilers, multiple interests, and multiple traditions are at play. This is not to say that the influence of its compiler, Sturla Þórðarson, cannot be felt—or seen in visualisations of his redaction's networks (see 6.6.1.b).

As stated, the acts of claiming and naming land embed a person into the landscape, simultaneously committing this conceptual unit (i.e. settler and their land-claim) to the collective memory of Icelanders (see 3.6.1). Migration and settlement were remembered in oral tradition but reformatted to fit contemporary and future societal needs before eventually being transmitted to the written mode (see 1.3.2). The early medieval compilers of *Ldn* would have been part of this process taking memories from the *landnám* (which they were only a few generations removed from) and compiling them to create a contemporary narrative of the *landnámsöld*. Therefore, these conceptual frameworks of migration, settlement, and interactions in a *landnám* society are upheld intergenerationally by a variety of interconnected individuals—the *landnámsmenn*, their descendants, historians, *Ldn* compilers (see 4.2). Sturla Þórðarson is just one of the 'distributed authors' in this network who organise and alter elements of migration, relationship, and settlement to suit his contemporary biases—both intentionally and unintentionally. He can selectively add, delete, and manipulate information about settlement to frame the audiences' perceptions on certain people, groups, or relationships.

This perception-framing is evidenced by how Sturla intentionally employs women in the networks of the Sturlungar to create desired connections to important Norwegian figures like King Haraldr (see 6.6.1.b). Furthermore, the high centrality rankings of Bjǫrn *buna*'s kin that indicate that this kin group is integral to upholding the narrative network's structure, illustrates both Sturla's knowledge of and desire to promote this family in the text (see 5.4, 5.5.3.b.i, 5.5.3.b.ii, 5.5.4.b, and 5.5.5.a.i). However, even though this is his interpretation of the *landnám*, Sturla must operate within the established conceptual framework (see 4.2). He can alter some boundaries like enlarging Skalla-Grímr's land-claim, but he cannot discuss this claim outside of the ultimate system of orientation or it would be uncontextualized. He works

within a genealogical charter that is comprised of a set pool of recognisable individuals attached to certain locations, but he can build narratives around these figures of memory to readjust their land-claims for the present and future (see 1.3.2.a). Therefore, Sturla's recorded individuals and relationships may not be viewed as 'historically accurate' in the modern mind, but this does not make his history and perception of settlement any less 'real' or valid compared to any other redaction of *Ldn* or account of migration in another source in the ON-I corpus. It served a purpose for him and his audience even if all reasons are not readily apparent to the modern viewer.

Sturla's ability to record and craft a complex network through text becomes apparent when subjecting his redaction to a SNA and VA approach. The individuals in the text feel familiar and their interactions are surprisingly reminiscent of modern relationships but take place in the *landnámsöld* (see 2.4 and 2.5). Outside of some context-specific, land-transaction and dispute relationships, most relationships can be mapped onto modern social networks (from a Westernised understanding of individuals and relationships); in this sense *S* speaks to the future. Parent-child relationships, husband-wife relationships, and those between neighbours are understandable and components of many societal structures. Therefore, the 'small-world', 'realistic' nature of *S* undoubtedly can be traced to the historical process of settlement and its collective remembrance that are both social endeavours.

7.1 Future Applications and Reflections

Like social networks, digital humanities approaches are shaped by multi-layered relationships between the humanities and the digital fields. This thesis employed SNA and VA to investigate historical and philological questions regarding how to use *S* as a historical source. Conversely, this thesis must interrogate these digital approaches to see if they were effectively applied to this text and help answer the questions asked of the text. This is a simultaneous and iterative process with the methodology and approaches constantly having to be refined and questions restructured. The difficulty of using this hybrid approach is negotiating the most effective interdisciplinary method to apply to

specific research questions, so that useful visualisations, graphs, statistics, etc. are generated that inform understanding of the source material. Sociograms and metrics are only tools of SNA, not its end results, but as with any project the right tool needs to be used to bring it to a successful completion. The narrative network graphs must be meaningful to the research to produce insightful analysis.

Ultimately, this thesis has demonstrated several of the possibilities of employing a mixed methods SNA approach and how questions of the historicity of *S* can be reconsidered when looking at information in new formats. Patterns emerged in visualisations and quantifications, which cannot be captured by using traditional historical and literary methods. Researchers can then look at these patterns and return to the texts to see if there are any previously overlooked details that explain this phenomenon.

The next logical progression of this approach is to not only refine it, but also to start applying SNA and VA to the other redactions of *Ldn* (*H*, *M*, *Sk*, and *P*) to visualise and quantify their social networks. Comparing the narrative networks of all *Ldn* redactions would not only provide insight into how the *landnám* network was perceived at particular points of time by a particular compiler, but also how views evolved over time within a complex system. Investigating what sections of the narrative networks remain consistent across all redactions could produce strong historical evidence for those individuals and their relationships. On the other hand, areas of narrative networks that drastically differ across redactions could show areas where memories of settlement were manipulated by that compiler.

This dataset can also be reused in future applications of SNA and VA to further investigate *S.* It could be uploaded into another SNA software like NodeGoat or Cytoscape to see how their algorithms transform, visualise, and quantify the data from *S* in in ways that lead to differently nuanced conclusions. This dataset could be used in conjunction with geo-spatial software like GIS to show how the network operates over space. Adding dates to individuals and their relationships in the dataset to create dynamic networks, networks that change over time, would better the understanding of the

chronology of settlement. Additionally, all these potential applications create opportunities for collaboration with specialists from other academic fields like computer science, onomastics, etc.

This thesis has demonstrated the value of this interdisciplinary social-network-theoretical approach by bringing textual scholarship and analysis on *Ldn* into the present and demonstrating its future *Ldn* and ON-I studies. The iterative nature of SNA and VA provides new ways to look at the old evidence and makes it possible for *S* to be constantly reevaluated and questioned. The only true limit to this approach is the researcher's creativity in employing these techniques.

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