Visualising Historical Networks
Family Trees and Wikipedia

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Abstract

This article situates itself within the growing field of digital heritage and will explore methods for digital representation of historical network. This includes a social family network as it is typically presented in a genealogical structure, consisting of all family members, as well as a network created by hyperlinks and linked data on Wikipedia. It uses the family tree of the Drachmann family in 19th century Copenhagen as a case to explore and compare these networks in a digital framework.

It will use the potential conflicts between Actor-Network Theory and Feminist Theory to frame this discussion.

Keywords family trees, GEDCOM file format, Wikidata, linked data, visualising history

Introduction

Publishing and visualising heritage material on digital platforms is important for research purposes as well as public dissemination and is a growing research area within the field of digital heritage. This cross-disciplinary field brings information science discussions

of data management, information retrieval and access to the work of digitisation and dissemination of heritage materials online (Ruthven and Chowdhury 2015). Many current information systems in heritage include very basic search and browse facilities, which become difficult to navigate when more and more heritage information becomes available through massive and continuous digitisation. Therefore, other methods for visualisation that encourage engagement and interaction with this material are currently being explores from several angles (Clough *et al.* 2015, 213-214).

Today the most popular form of engagement with heritage material in the public sphere is through family-history or genealogy. The web is host to thousands of websites and communities that allow the public to sift through history in search of their own ancestors and their own history (De Groot 2016, 71-72). In order to tap into this keen interest in the very pressing quest for social impact it makes sense to consider methods for visualising heritage material that also focus on family networks.

Social networks, such as families, and the influence of these in historical power structures is a well-established subject within the field of history, particularly in relation to medieval power structures across Europe. This is most noticeable when it comes to the inter-marriage between powerful families and royal houses, as well as being a key element in the control of property (Lyon 2013, 16). However, in relation to intellectual and creative developments in 19th century, the role of families has largely been ignored. When family relationships are acknowledged in a medieval context it is also with a strong focus on male lineage rather than, sisters, mothers, daughters or the entire family network, thus leaving large gaps in our understanding of family relationships and the opportunities which they afforded to individual family members (Bastress-Dukehart 2008, 62).

This article will explore two different methods for visualising and understanding a historical family network using the Drachmann family of 19th century Copenhagen as a case. The first is a more traditional method with a hierarchical family tree, which explores a visual tree-like structure and an encoded data structure using the file format GEDCOM. The second method looks at the same family in Wikipedia first through hyperlinks and secondly as linked data in Wikidata. The article will discuss the similarities and differences

between these two network representations of the same family and the consequences of this as it is related to the potential conflicts between Actor-Network Theory (ANT) and Feminist Theory.

Case: Drachmann family

The 19th Century Drachmann family in Copenhagen, Denmark, is perhaps best known through poet and artist, Holger Drachmann. Other notable family members include his older sister, Erna Drachmann (married Juel-Hansen), who was active as a Danish suffragette and pedagogue, as well as his cousins: Teacher and vice headmistress, Emma Holmsted (married Hørup), who married another cousin, politician, editor and co-founder of the Danish newspaper Politiken, Viggo Hørup, who again had a long-standing relationship with a third cousin, teacher and suffragette, Henriette Steen. What makes this a remarkable and interesting family is that despite their shared grandparents' (Lovise Kobiersky and Mathias Drachmann) rather humble life in Copenhagen, several members of this third generation acquired some quite prominent intellectual and creative positions in 19th Century Copenhagen. Nevertheless, only the achievements of the male family members were recorded outside of the Danish Women's Biographical Lexicon hosted by KVINFO (Danish Centre for Gender, Equality and Diversity), thus construing their place in history as their own singular achievements rather than their part in a family network of intellectually and creatively active men and women.

This is mainly because understanding of the past is not influenced directly by the past but by the dominant versions of the past (Corrigan and Mills 2012). So if the dominant views of the past only visualise a partial network of historical person's connection to each other as in the case of the Drachmann family, then our historical understanding of the past is based on this biased network. The influence of siblings, cousins, and in-laws, and in particular female family members is hidden. This leads to an understanding of history that excludes family networks in general and women specifically (Ewan and Nugent 2008).

The focus on family networks comes from genealogy where there would traditionally be a focus on finding direct (male) lineage (Bastress-Dukehart 2008). However, genealogy or family history has become such a popular leisure activity, stereotypically among the

newly retired elderly, but certainly also amongst other age groups too (Ridge 2017). The web facilitates this activity immensely and is the main reason for the growth in popularity of this leisure activity. First and foremost it has become much easier to access information about family members over the web. Secondly, the web has facilitated the building of family trees in an effortless and fairly uncomplicated manner. Thirdly, and most importantly for some, the web allows for the sharing and connecting between family trees/networks. Suddenly, it is possible with the click of a button to get in touch with a distant family member who also has an interest in your shared ancestors.

It can be argued that Wikipedia forms one of the most dominant views of the past, with its overarching goal of providing access to the "sum of all human knowledge" ('Wikipedia:Purpose' 2016; Rosenzweig 2006). Wikipedia is however currently in the midst of an ideological battle about what should be included in the concept of all the world's knowledge and particularly who should be included (Ford 2016). Feminist and black lives matter movements are currently working on including more women and people of colour into the fabric of history by adding these people and their histories to Wikipedia (Roued-Cunliffe 2017). But one of the main obstacles is the concept of notability which has over time become a cornerstone for Wikipedia (Wagner *et al.* 2015). The doubts cast on these peoples notability in terms of inclusion into Wikipedia (Borgen *et al.* 2016) is mirrored by their absence from traditional historical accounts. However, "all constructions are historically contingent, no matter how stabilized" (Star, 1991, p. 38). This goes for Wikipedia as well as more traditional historical accounts, bibliographies and encyclopedias. This is a matter that the Wikimedia Foundation is focused on and one analysis found that when comparing to traditional biographies Wikipedia already contained a much better weighting of women (Reagle and Rhue 2011).

The Family Tree

There are two traditional ways of viewing a family in a tree-structure. You can begin from the bottom and show the ancestors of a person above them with the parents to either side and the parent's parents above them. This is a very popular chart in most current genealogy software as most people would begin their own family

history research with themselves or their parents in the middle and then work back from there. Langholz (1989) does this by tracing back the male lineage of Holger Drachmann to his ancestor Geert Drachmann, born around 1679 in Bremen.

The other method, begins with someone further back in time, or an older family member, perhaps a couple and draw connections down to their children. Each child leads to further connections to a spouse and their children and so forth. Today many family historians would input their family members into a digital system where you can add family members both forwards and backwards in time. In other words, for a single person, you can add both their parents and their children at the same time, which gives more of an hourglass appearance to the individual's family chart. Once these family members are in the database you can choose to view a chart of the person's ancestors, descendants or both at the same time.

In the case of the Drachmann family the focus is on the descendants of Lovise Kobersky and Mathias Drachmann, beginning with them and listing their children together with their spouses. Under the children is listed each new family's children and their spouses and so forth (fig. 1).
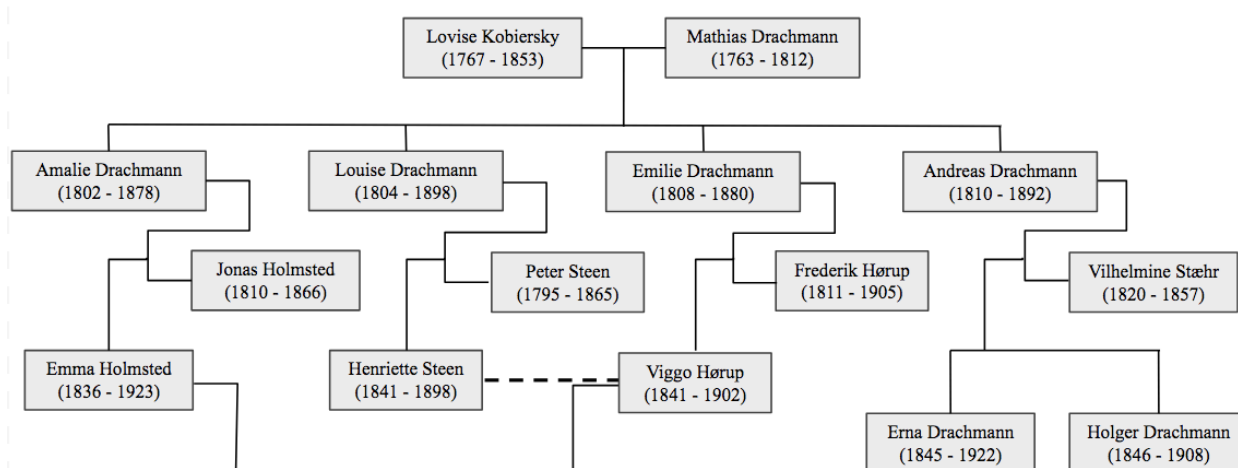
Fig. 1 Family tree for Lovise Kobiersky and Mathias Drachmann with select descendants (not complete).

The GEDCOM file

Most family history research today happens digitally with more and more people being able to connect their family tree datasets to each other, thus potentially creating a large historica[1] network of humans that have lived. It is a fascinating thought and there are big collaborative projects dedicated to do just that1. Others focus more on their own family and meeting distant living relatives. Whatever the motivation some sort of standard file type that enables sharing of these family networks and the years of work that has gone into them, needed to be developed. The most resilient one has turned out to be the GEDCOM (Genealogical Data Communication) format. It was first released in 1984 by The Church of Jesus Christ of Latter-day Saints (Jones 2010). GEDCOM files are plain-text files which list individuals after a unique numbering system. For each individual the GEDCOM format lists bibliographical metadata as well as links to families. Individuals are linked through families and each family can contain only parents and their children (fig. 2). Perhaps not surprising when you consider the origin of the GEDCOM format it does promote a very binary view on genders and family structures. For example families can only contain one mother and one father, or rather one wife and one husband. However, due to a quirk in the format there is an assumption that the individual linked to the family as a husband is male and the individual linked as a wife is female (Jones 2016). Therefore, neither GEDCOM or GEDCOM readers actually run checks to make sure that this is the case and people are thus free to add a same sex couple as husband and wife in GEDCOM. They will however still be referred to as husband and wife, mother and father.

```
0 @F122@ FAM          0 @I377@ INDI               0 @F123@ FAM
1 WIFE @I375@         1 NAME Amalie /Drachmann/    1 WIFE @I377@
1 HUSB @I376@         2 GIVN Amalie                1 HUSB @I388@
1 MARR                2 SURN Drachmann             1 CHIL @I393@
2 DATE ABT 1790       2 _MARNM Amalie /Holmsted/
1 CHIL @I377@         1 SEX F
1 CHIL @I380@         1 BIRT
1 CHIL @I381@         2 DATE 1802
1 CHIL @I360@         1 DEAT
                      2 DATE 1878
                      1 FAMC @F122@
                      1 FAMS @F123@
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Fig. 2: GEDCOM records featuring Amalie Drachmann. 1) the family she was born into where she is listed as a child, 2) her record, 3) the family she had with her husband.

Wikipedia

On Wikipedia people just as concepts, places, and everything else are linked together through hyperlinks. Hyperlinks are the foundation stone of the web as Tim Berners-Lee imagined it (Berners-Lee *et al.* 2001). Each page on Wikipedia will through hyperlinks in the text link to many other pages. For example, on Holger Drachmann's article, his father's name, Andreas Georg Drachmann, is a link to the article on the father. How many links and where they are placed is completely up to the editors working on the page. Because these links form a part of the text that is written they can in theory be links to anything. Here it is possible to write that Holger Drachmann is a cousin of Viggo Hørup, Emma Holmsted and Henriette Steen, or that he was very close to his older sister Erna Drachmann. Each mention of these people will have a link to each of their own pages if they themselves are deemed notable enough to have a page. Sometimes someone is deemed notable enough to have a page but the page just has not been created yet. In these cases the hyperlink to the person will be displayed in Wikipedia as red instead of the active blue link (fig. 3).

Familie

Holger var lillebror til pædagog og kvindesagsforkæmper Erna Juel-Hansen, halvbror til klassisk filolog Anders Bjørn Drachmann og fætter til politikeren Viggo Hørup, samt Viggos kone, viceskoleinspektøren Emma Hørup, og lærerinde Henriette Steen.

Fig. 3: Screenshot showing how Holger Drachmann's family network could be mentioned on Danish Wikipedia.

Wikidata

Wikidata is, like Wikipedia, an entity under the Wikimedia Foundation. It is built on the concept of linked data which can be expressed in many different formats and mainly consist of triplets linking together the subject, the predicate and the object (Berners-Lee *et al.*, 2001).

subject -> predicate -> object

These triplets can be used to express any kind of relationship between elements for example:

Holger Drachmann -> is part of -> Drachmann family

Where "Holger Drachmann" is the subject, "is part of" is the predicate linking the subject to the object and "Drachmann family" is the object that is being linked to. In Wikidata it is possible to tie people together in family relationships through the predicates: mother, father, child(ren), sister, brother, and spouse (fig. 4).

father	Andreas Georg Drachmann	edit
	▾ 0 references	
		+ add reference
		+ add value

sibling	Erna Juel-Hansen	edit
	▾ 0 references	
		+ add reference

Fig. 4: Screenshot of Wikidata for Holger Drachmann with family ties to his father and sister.

The strength of the linked data approach of Wikidata is that you can produce tools like GeneaWiki[2] (fig. 5), which can visualise this family network through the use of certain predicates (i.e. mother, father and children). In order to view this network in a manner bearing a closer resemblance to a family tree it would be useful if the network also used the predicate spouse. However, the nature of Wikidata tools is such that anyone could develop this if they found a need for it. The main advantage of WikiData is the ability to link instances of a Wikipedia article in one language to the same article in another language. For example a page about Holger Drachmann is available in 16 different languages on Wikipedia because he is an internationally renowned poet. Other family members may not be of the same interest to as many language Wikipedias as him, but through Wikidata they and their relationship to Holger can still be discovered.
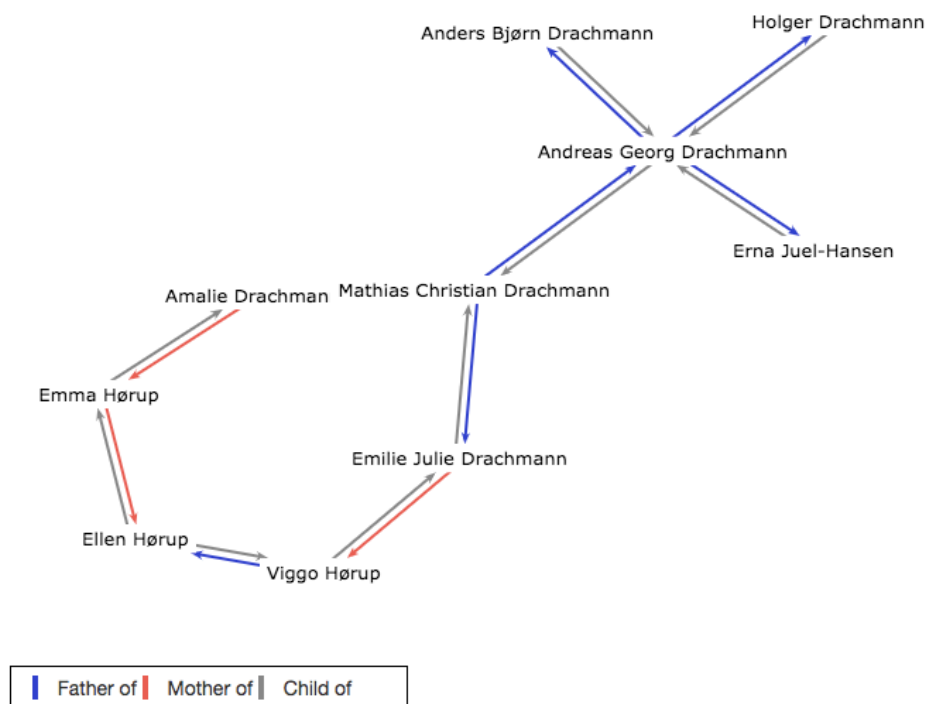
Fig. 5: Screenshot of GeneaWiki network based on Wikidata links which shows the relationship between Holger Drachmann and journalist and author Ellen Hørup. Red arrows: Mother of, Blue arrows: Father of, Grey arrows: Child of.

Comparing family network visualisations

While feminist scholarship encourages us to look through the lense of the marginalised to see power structures it is also clear that in order to understand the full messiness of this creative network of family members it requires something like ANT to comprehend its full extent and potential (Quinlan 2012). However, ANT does not let us see what is missing in the network (Corrigan and Mills 2012), only Feminist Theory will spot that there are few women on Wikipedia for example.

The above-mentioned four methods for visualising family networks each include and exclude different parts of this potential family network. On Wikipedia it is possible to add information about family members but in order to link them each family member must have their own Wikipedia article and this is at odds with

Wikipedias notability policy. I first became interested in the Drachmann family through journalist Ellen Hørup. At the time only her father, Viggo Hørup, was on Wikipedia and there was a short mention of how he was a cousin of Holger Drachmann. Keeping in mind my knowledge of genealogy I was intrigued and as I examined the female members of the family I realised how this connection was not only between Viggo Hørup and Holger Drachmann but that there was a larger family network present, tied together by Holger's father and at least four of his sisters. The women in the family were particularly active in the Danish suffragette movement of the late 19th century.

On the other hand, the traditional methods for visualising family networks used in genealogy only allow us to link spouses, parents and children. However, it is by no means a guarantee that people who are directly related have a relationship that can for example lead to creative and intellectual innovation. However, in Wikipedia, the free-text format with embedded hyperlinks allows for the expression of these kinds of relationships. For example in the words of Emma Holmsted, when writing about her uncle, Andreas Georg Drachmann:

> His house was an open and hospitable refuge both before and after my marriage with Viggo Hørup; here we met many distinguished men and women, and made friends with not so few of the circle of young people who gradually gathered around Holger Drachmann and his family.[3]

This type of information or even the quote itself is suitable on Wikipedia, where links can be added to the different people mentioned and their Wikipedia pages. This enables us to express that certain family members had a very close relationship as well as include people with no direct family ties in this relationship, but only if they are notable. In contrast a typical family tree has room for everyone directly related no matter how obscure they may be in the public eye. In Wikidata there is also a notability demand with an exception, in that elements can be added if they serve a structural purpose for the network. I would argue that the women in the Drachmann family, in particular the sisters of the second generation, indeed do serve a structural purpose, even if not enough is known

about them to deem them notable, simply because they connect the different family members of the third generation in order to understand the family as a network rather than a collection of notable people.

	Family Tree	GEDCOM	Wikipedia	WikiData
Only notable people	No	No	Yes	Mainly with exceptions
Only direct family relationships	Yes	Yes	No	Yes
Include nature of relationship	No	No	Yes	No
Easily accessible online	Partially	Partially	Yes	Partially

Conclusion

The different methods for visualising family networks presented here serve different purposes for understanding family networks and the way they have influenced the people in and connected to a certain family. A traditional family tree in a digital format and as a GEDCOM can be accessed online if it has been made public and it is open to all family members no matter how well-known they are. However, it only allows for direct family relationships between parents, children and spouses and does not tell us anything about the nature of these relationships.

This is also the case for WikiData with the exception that here the people included must be notable unless they serve a structural purpose. In contrast Wikipedia enables the inclusion of other relationships and the nature of these as well as being very easy to access online. The issue here is the exclusion of people not thought to be notable from the network. From the perspective of ANT it would be fully possible to understand the very messy network of people surrounding someone like Holger Drachmann through the information available on Wikipedia. However, when adding Feminist The-

ory into the mix the necessity of extending this network to family members who were not as notable as Holger Drachmann is evident. In other words when publically visualising and historically documenting family networks and their significance for society as well as the individual family members it is well worth taking into account the different approaches.

The consequents of this, in terms of using family networks as a method for visualising heritage material, is that no one method provides a complete solution. However, any one of the aforementioned methods is potentially useful for those with an interest in history and can thus give digitised heritage material a wider social impact than is currently the case.

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Notes

1 The WikiTree project is a good example of this. http://www.wikitree.com/

2 GeneaWiki by Magnus Manske (https://tools.wmflabs.org/magnus-toolserver/ts2/geneawiki/)

3 Handwritten memoirs of Emma Hørup (1836-1923), transcribed and translated into English by the author of this article. Royal Danish Library, acc. 2001/91, ks. 122a