USING A (LINEAGE LINKED) FAMILY PERSPECTIVE OVER HOUSEHOLD TO IMPROVE RECORD LINKAGE SUCCESS WITH CENSUS (AND OTHER) DATA COLLECTIONS
Introduction

Our Proposal is that:

• Creating lineage linked families and pedigrees from census data will
• Provide a broader footprint
• Thereby increasing opportunities for matching
• And improving record linkage success
In other words - We think changing this...

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To this ...
Will improve record linkage success
Traditionally work with census data:

- Uses the Household as the main unit of identification
Introduction

• By using “the lineage linked family” as the main unit of identification

• We can accumulate more data from the record which improves opportunities for record linkage
Using a lineage linked family perspective:

• Preserves linkage that is already in the data
• Can provide a more accurate representation of the family
• Preserves families not related to the head of the household, such as servants or boarders, etc.
Adding genealogical interpretation and a few derived records allows us to capture:

- Sibling families
- In-law families
- Multi-generational families
Using local customs like patronymic naming patterns:

- Can provide a father’s given name that is not stated in the census
If a marriage date is present we can:

• Identify and preserve “hidden families”
  • Children by the husband’s previous marriage
  • Children by the previous marriage of both spouses (yours, mine, and ours families)
  • A Mother that has remarried
We have adopted the coding data fields and values used by the North Atlantic Population Project (NAPP)

At the Minnesota Population Center

University of Minnesota, Minneapolis
Their coding process identifies:

• Each household

• The head of each household

• The relationship of each person to the head

• The position of each person within the household

• The position of each person’s spouse (in house)

• The position of each person’s father (in house)

• The position of each person’s mother (in house)
We added a few more values to:

• Better handle Sibling-in-law relationships
  • Sibling-in-law = Your Spouse’s Sibling
  • Sibling-in-law = Your Sibling’s Spouse
  • Sibling-in-law = Your Spouse’s Sibling’s Spouse
We also added for Norway, a data field that:

- Allowed us to derive a father’s given name
- From the child’s patronymic surname
- When no father was present in the census
• These relationship and position pointers allow us to create lineage linked families

We worked with one of our vendors

• Pleiades Software Development, Inc.

• To create a tool that would convert a flat file with these relationships and position pointers to a Gedcom file for us.
Using Relationship pointers alone - converter links:

- Head
- Spouse
- Child
- Sibling
- Parent
- Parent-in-law
- Sibling-in-law
# Data Converter - CensusToGed

**Relationships only – links simple families**

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## Descendants of Mikkel ENGBRETSEN

- **Mikkel ENGBRETSEN (178)**
  - b. 1825, Sar-Aurals, Oppland, Norway

- **Siri ERIKSDATTER (179)**
  - b. 1832, Nord-Aurals, Oppland, Norway

- **Erik MIKKELSEN (180)**
  - b. 1854, Sar-Aurals, Oppland, Norway

- **Margit KNUTSDATTER (184)**
  - b. 1860, Sel, Buskerud, Norway

- **Mikkel MIKKELSEN (181)**
  - b. 1854, Sar-Aurals, Oppland, Norway

- **Arne MIKKELSEN (184)**
  - b. 1879, Sar-Aurals, Oppland, Norway

- **Ingeborg Mikkelsdatter (182)**
  - b. 1881, Sar-Aurals, Oppland, Norway
Data Converter - CensusToGed

- Relationships only – but it misses some links

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Descendants of Mikkel ENGEBRETSEN
Using relationship and position pointers it links:

- All of the previously stated relationships - plus
- Grandchildren
- Hidden families
- Yours, Mine, and Ours families
- Boarder or Servant families
- And many others
### Data Converter - CensusToGed

#### Using Relationships and Position Pointers

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#### Descendants of Mikkel ENGBRETSEN

- **Mikkel ENGBRETSEN (175)**
  - Born: 1825, Sun-Aurast, Oppland, Norway

- **Siri ENGBRETSEN (179)**
  - Born: 1832, Sun-Aurast, Oppland, Norway

- **Mikkel ENGBRETSEN (199)**
  - Born: 1868, Sun-Aurast, Oppland, Norway
  - Wife: **Sigrid ERIKS (199)**
    - Born: 1869, Sun-Aurast, Oppland, Norway
  - Son: **Arne ENGBRETSEN (191)**
    - Born: 1918, Sun-Aurast, Oppland, Norway
  - Daughter: **Ingeborg ENGBRETSEN (193)**
    - Born: 1901, Sun-Aurast, Oppland, Norway

- **Erik ENGBRETSEN (197)**
  - Born: 1868, Sun-Aurast, Oppland, Norway

- **Sigrid ERIKS (199)**
  - Born: 1869, Sun-Aurast, Oppland, Norway

- **Knut ERIKS (198)**
  - Born: 1903, Sun-Aurast, Oppland, Norway

- **Michael ERIKS (198)**
  - Born: 1906, Sun-Aurast, Oppland, Norway
By capturing all of the relationship data in the census as a lineage linked family

We provide a broader footprint to match on

We will come back to these grandchildren
Providing a Broader Foot Print

• More examples of how we have been able to broaden the footprint of the census are in the appendix to this paper.

• I am going to quickly flash through most of them.

• You can study them more closely later.
### Household of siblings - DerivedFath.

#### 1900 US Census for Lewis County Washington

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#### Ancestors of Charles C HENDERSON

- **Charles C HENDERSON [5787]**
  - b. 1872, Massachusetts, United States

- **Joseph A HENDERSON [5788]**
  - b. 1876, Massachusetts, United States

- **Flora E HENDERSON [5791]**
  - b. 1860, Kansas, United States

- **Florence A HENDERSON [5792]**
  - b. 1862, Kansas, United States

- **Albert E HENDERSON [5789]**
  - b. 1885, Kansas, United States

- **Carl R HENDERSON [5790]**
  - b. 1887, Kansas, United States

- **(→) HENDERSON [5793]**
  - b. Massachusetts, United States
Sister-in-law (DerivedFath. & Hus)

1900 US Census for Lewis County Washington

<table>
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Descendants of Unknown (---)

Unknown (---) [6221]
  b. . Maine, United States
  Unknown

Erwina A (---) [6219]
  b. 1833 , Maine, United States
  (-->) WHEELock [6220]

Adeliza (---) [6214]
  b. 1840 , Massachusetts, United States

John B JONES [6213]
  b. 1823 , New York, United States
  m. 1862

Elizabeth H JONES [6216]
  b. 1867 , New York, United States

William F TULES [6215]
  b. 1862 , New York, United States
  m. 1890

Irene M TULES [6217]
  b. 1892 , Washington

Martha I TULES [6218]
  b. 1899 , Washington
Parents-in-law (by Derived Spouse)

### 1900 US Census for Lewis County, Washington

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### Ancestors of Rena MCFADDEN

- **Obediah MCFADDEN [862]**: b. 1847, Pennsylvania, United States
- **Kate McFADDEN [864]**: b. 1887, Washington
- **Robert MCFADDEN [868]**: b. 1889, Washington
- **Judith MCFADDEN [866]**: b. 1897, Washington
- **Viola MCFADDEN [865]**: b. 1898, Washington
- **Alpha MCFADDEN [867]**: b. 1899, Washington
- **(...) HANSON [872]**: b. , Wisconsin, United States
- **Harold HANSON [870]**: b. 1826, Norway m. 1850
- **Ingrid ( ...) [871]**: b. 1830, Norway
Hidden Family: Previous Marriage

1900 US Census for Lewis County, Washington

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Descendants of Joke Aust

- Magie Aust [3499]
  - b. 1876, Germany
  - m. 1893

- Frank Aust [3500]
  - b. 1885, Austria

- Emma Aust [3501]
  - b. 1907, Kansas, United States

- Ella Aust [3502]
  - b. 1900, Washington

- Minnie Aust [3503]
  - b. 1892, Washington

- Rosa Aust [3504]
  - b. 1895, Washington

- Willie Aust [3505]
  - b. 1897, Washington

- Lizzie Aust [3506]
  - b. 1898, Washington

- Unknown
Hidden Family: Mother remarried

Descendants of Charlotta (---)

- Charlotta (---) [5901]
  - b. 1841, "Ohio, United States"
- (--|--) FOOTE [5902]
  - b. "Ohio, United States"
- (--|--) GARRETTSON [5904]
- Ellsworth B FOOTE [5895]
  - b. 1865, "Ohio, United States"
- Clara V (---) [5906]
  - b. 1869, "Kansas, United States"
  - m. 1891
- Theodosia C FOOTE [5900]
  - b. 1875, "Ohio, United States"
  - Div.
- Frederick FOOTE [5897]
  - b. 1892, "Washington"
- Jay FOOTE [5898]
  - b. 1896, "Washington"
- John FOOTE [5899]
  - b. 1896, "Washington"
Non-relatives (boarders or servants)

1900 US Census for Lewis County Washington

<table>
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<th>CENSUS_NAME</th>
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Descendants of Mary A (---)

Mary A (---) [10496]
b. 1850, Missouri, United States

(---) REEDER [10502]
b. 1882, Ohio, United States

Joseph REEDER [10497]
b. 1882, Missouri, United States

Descendants of Walter E STANTON

Walter E STANTON [10498]
b. 1860, Illinois, United States

Olive (---) [10499]
b. 1864, Iowa, United States m. 1883

Anna STANTON [10501]
b. 1890, England

Fern STANTON [10500]
b. 1896, California, United States
Now we need to answer the question is it worth the effort it takes to capture that lineage linked family data.
To test our proposal we merged:

• Bygdebokand 1900 Norway Census data for Sør-Aurdal, Oppland, Norway

• Bygdeboks are local histories often containing extended family lineages

• Sør-Aurdal had 4 Bygdeboks
  • which we extracted using PAF and
  • merged into one lineage linked database
We focused our attention on grandchildren:

• There were 38 grandchildren in 1900 Sør-Aurdal

• We found 24 of the grandchildren in the Bygdebok data

• From 10 households in the census

• These households had a connecting parent in the census data (giving at least a 3 generation link)
For our Census Data Samples we used:

- 1900 converted using pointers – Linked
- 1900 converted without pointers - Unlinked
- (grandchildren were not linked to family)
• We used GenMergeDB as our merging tool
  • With the same settings in each test

• The Bygdebok data also remained constant

• Therefore the only changing variable was the linked and unlinked nature of the census data
Merging Results

• Bygdebokand 1900 Census with Links
  • 18 of 24 grandchildren were matched (75%)

• Bygdebokand 1900 Census without Links
  • 0 of 24 grandchildren were matched (0%)
Merging Results

- Second Test - Used the census full data set
  - For the unlinked sample we removed all of the family links from the linked Gedcom file - left just individuals

- Bygdebok and Census - Linked
  - Found 3414 people in 1659 clusters

- Bygdebok and Census - Unlinked
  - Found 98 people in 49 clusters

- Only 3% of the matches in the Linked sample were found in the Unlinked sample
• The test results for the grandchildren showed that the lineage linked nature of the data was critical to merging success
  • 75% Linked sample matching verses 0% Unlinked

• The merging with the full Census with the Bygdebokdata did only slightly better
  • Only 3% of the matches found in the linked sample were found using the unlinked sample
Our conclusion is ....

That there is a lot of record linking advantage to be gained by converting census data (or other data sources) to lineage linked family data before merging.
• Are there any questions?

• Contact information:
  
  • David S. Barss
  
  • E-Mail: barssds@familysearch.org

• Come see use at the Family Reconstitution table in the Family Search booth
Thank you