

**Relieved of These Little Chores: Agricultural Neighbor Labor, Family Labor, and
Kinship in the United States 1790-1940**

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Abstract

Jeffersonian yeoman agricultural tradition represents the “pick yourself up by your bootstraps” narrative of United States identity with its emphasis on independence, hard-work, and strong family networks. This Jeffersonian narrative specifically focuses on the patriarchal authority of the white male farmer taming nature and the frontier, ignoring the importance and roles of women, children, and social networks on the farm. My dissertation uses farm diaries and the Census to address these invisible forms of labor largely ignored in the traditional narrative.

Andrew Peterson’s diaries described family labor and neighbor labor exchanged with nearby families. While living in a frontier area, exchanged neighbor labor worked with the Peterson household through the 1860s until Andrew’s children were old enough to work in the fields. Neighborhood exchange of labor complemented a low worker to consumer ratio within the Peterson household, and was not simply a frontier or pre-capitalist form of bartering. Farm diaries better describe the work of these invisible groups than the Census, but Andrew still underreported women’s work due to traditional narrative biases.

Gendered ideologies and census procedures emphasized norms of separate work spheres and reinforced the traditional agricultural narrative at the expense of these invisible groups. While most of the bias for women occurred in planning by Census officials, enumerator practices and biases resulted in inconsistent reporting for children. Biases such as month of enumeration and sex of the respondent were small but statistically significant for women and children. Other important socio-demographic variables for occupational responses included age, school attendance, marital status, and parental occupation.

Availability of new complete count census data allows for measuring kin networks beyond the household. Kin propinquity declined in the United States from 30% in 1790 to 6% by 1940, which closely mirrored long-term declines in agriculture and intergenerational coresidence due to urbanization and industrialization. Kin propinquity was especially high in New England prior to 1840, and Appalachia and Utah after 1850. The convergence in kin propinquity rates for younger and elderly people between 1850 and 1940 were caused by declining fertility, declining mortality, and younger generations leaving the farm with better economic opportunities elsewhere.

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Introduction: Invisible Labor and Networks

During Super Bowl XLVII in 2013 a commercial presented several photos of farmers. With Paul Harvey's "So God Made a Farmer" address, a famous speech at the 1978 Future Farmers of America convention, playing in the background, photos of farmers performing different tasks were shown. The commercial ended with a Dodge pickup truck being advertised. The photos were predominantly white men with few women, children, or people of color shown.¹

Because the goal of this commercial was to appeal to a specific audience in order to sell trucks, Dodge used a typical narrative of American agriculture. The narrative of white men conforming nature to his will, all with the sweat of his brow and strength of his back, and remaining independent of markets and wage labor, ties directly to Jeffersonian ideology of yeoman farmers from the 1780s and Turnerian frontierism. Just as in the Dodge commercials showing few women and children, women and children were supposedly dependent on the work of the farmer. Slaves and migrant workers are also absent from this story. While the farmer in Jefferson's time was not specifically identified as white, given the status of blacks and the institution of slavery, Jefferson does not need to identify the race of the farmer for the reader to know whom he referred to.²

This invisibility of labor, however does not mesh with the historical record. Time-use studies from the 1920s and women's and children's diaries all attest to the amount of

¹ Ram Trucks. "Official Ram Trucks Super Bowl Commercial 'Farmer,'" YouTube Video, 2:02, Posted (Feb 2013), https://www.youtube.com/watch?v=H7yZdOI_e_c.

² Thomas Jefferson. *Notes on the State of Virginia*. 3rd Ed. 1781. 290-291. Frederick Jackson Turner, "The Significance of the Frontier in American History," *Report of the American Historical Association for 1893* (Washington D.C: Government Printing Office, 1894), 201.

work they performed.³ The agricultural labor of women and children has not only been underrepresented, but was fundamental and often a larger contribution than the single male farmer. Given the popular Jeffersonian agricultural myth that dependent women and children contributed little to family agriculture, clearly one of the narratives is incorrect. Statistics gathered by the Census reinforce the traditional narrative. While that suggests that women's and children's recollections of work was unrepresentative, traditional statistics in fact did not measure agricultural labor very well.

On the contrary, occupational response bias is well documented in the literature. Ideological and gendered expectations devalued household labor, and like all valuable sources historians use, occupational census returns should be critiqued.⁴ For example, while occupational returns showed many women keeping house, we also have diaries describing extensive work in the fields alongside men. Clearly, the work of women and children was largely invisible. This raises the question of how invisible was their labor and can it be recaptured?

Other invisible entities include neighbor labor and kin beyond the household. Neighbor labor, or the exchange of labor between families living near one another, has been accepted as part of the premarket farm economy. While this assertion is problematic, I focus on the family life cycle mechanisms for neighbor labor. Does neighbor labor represent low market labor supply, meaning a farmer's only choice was to exchange labor,

³ G.E. Wasson, *The Use of Time by South Dakota Farm Homemakers*, South Dakota State College of Agriculture and Mechanic Arts, Agricultural Experiment Station (1930). Lu Ann Jones, *Mama learned us to Work: Farm Women in the New South*, (Chapel Hill: University of North Carolina Press, 2001). Pamela Riney-Kehrberg, *Childhood on the Farm: Work, Play and Coming of Age in the Midwest*, (Lawrence: University of Kansas Press, 2005).

⁴ Margo J. Anderson, *The American Census: A Social History*, (New Haven: Yale University Press, 1988). Nancy Folbre, "The Unproductive Housewife: Her Evolution in Nineteenth-Century Economic Thought," *Signs*, 16:3 (1991), 463-484.

or a lack of family labor supply, where the supposed independent farmer with a wife and young children required additional help? Another form of neighbor labor were kin living nearby. It is generally accepted that farmers lived near kin historically, but we have little information on precisely how common kin propinquity actually was. Kin propinquity, or the proximity of nearby kin, represents one aspect of the strength of kinship ties and relationships.

My dissertation uses unique methods and sources to analyze neighbor labor, women's labor, children's labor, and kin propinquity. I use a single, detailed farmer account to analyze the use of exchange labor over the farmer's individual life course. In this microhistory, I analyze trends in the use of different forms of invisible labor to describe the roles of exchange labor and family labor for one farm family. I analyze women's and children's labor in the account book and occupational returns in the Census. Focusing on sociodemographic traits and enumeration procedures and biases, I explore why some women and children returned an occupation and not others. Finally, my method for measuring kin propinquity leverages surnames and sequential ordering of households to crudely measure kin propinquity that is nationally representative for 150 years of U.S. history.

All of the data comes from the Andrew Peterson Diary and the Integrated Public Use Microdata Series (IPUMS), which includes IPUMS-USA, the North Atlantic Population Project (IPUMS-NAPP), and the IPUMS Restricted Complete Count Census Data.⁵ The Andrew Peterson diaries were coded by me and used in the analysis of exchange

⁵ Andrew Peterson, & Emma M. Ahlquist (tr), *Andrew Peterson and Family Papers 1850-2007*, (St. Paul: Minnesota Historical Society, 2007). Steven Ruggles, et al., *Integrated Public Use Microdata Series: Version 7.0* [dataset], Minneapolis: University of Minnesota, (2017). Minnesota Population Center *North Atlantic Population Project*:

and family labor in Chapter 2. Chapter 3 uses census samples from IPUMS-USA for the years 1850-1870, samples for 1900-1940, and complete count 1880 data from IPUMS-NAPP to analyze occupational responses. I use the Complete Count IPUMS-NAPP data for 1850 and 1880 along with the Restricted Complete Count Census data from IPUMS and National Historical Geographic Information System (IPUMS-NHGIS) in Chapter 4 and Appendix B to measure kin propinquity.⁶

Chapter 1 provides a brief review of the literature of debates and findings for U.S. agricultural and demographic history since the eighteenth century. Topics include the market vs subsistence family farm debates, devaluation of women's labor, census biases, a economic and demographic transitions since 1850, and new methods and sources of data that researchers recently used to answer questions around intergenerational transmission of demographic behavior and economic outcomes. I conclude with a few questions I feel the literature has not answered regarding agricultural labor and kinship, and how my dissertation addresses gaps in the literature by asking new questions or answering current ones.

In Chapter 2, I use farmer diaries and letters, specifically Andrew Peterson's account book to describe the mechanism of neighbor labor exchange and how women and children's labor played a role on the farm over the family life cycle.⁷ Neighbor labor, specifically from men, helped Andrew Peterson during the early years of his life course when he was unmarried and later with a wife and young children. While neighbor labor

Complete Count Microdata: Version 2.2 [machine-readable database], Minneapolis: Minnesota Population Center, (2015). Minnesota Population Center, & Ancestry.com, *IPUMS Restricted Complete Count Data: Version 1.0* [Machine readable database], Minneapolis: University of Minnesota, (2013).

⁶ Steve Manson, et al., *IPUMS National Historical Geographic Information System: Version 12.0* [database], Minneapolis: University of Minnesota, (2017).

⁷ Appendix A describes the coding process and how I calculated my labor measure.

did not assist with all work, Peterson relied heavily on male neighbor labor until his sons began working around age 12. While Andrew hired labor extensively to build a new house and assist with farm work, his continued use of neighbor labor exchange suggests he did not use neighbor labor because he lived in a frontier region or a lack of market labor. Andrew's wife Elsa worked in the fields, but Andrew did not record Elsa's work in the household, underreporting her contributions to the farming operation like the traditional narrative. A conservative adjustment of female family labor in Andrew's account books showed that female family labor contributed as much and more labor than Andrew by himself.

In Chapter 3, I analyze occupational responses of women and children in the Census for farm families. Non-occupational responses such as "Keeping House" and "At Home" do not accurately capture the agricultural contributions of women and children. Along with gendered and ideological biases, socioeconomic indicators such as age, marital status, and parental occupational status influenced occupational responses for women and children. Systematic enumeration procedures biased and impacted results including month of enumeration, sex of the household respondent, and enumerator bias.

Chapter 4 addresses kin propinquity in the United States between 1790 and 1940.⁸ Using complete count census data, I measure the spatial structure of kin propinquity using an egocentric isonymic matching given the sequential ordering of households in the Census.⁹ Coinciding with the decline of agriculture and increased urbanization, kin

⁸ Appendix B describe the data quality issues with the data, how kin propinquity was corrected for areas with data quality issues, the accuracy of the corrections, and overall accuracy of the method.

⁹ My method matches individual-level surnames to the surnames of persons living in nearby households. A matched surname indicates potential kin association.

propinquity declined from around 30% in 1790 to approximately 6% in 1940. This long-term decline closely matched larger economic and demographic transformations in the United States and provides insights on the timing and geographic distribution of these transformations. These transformations include industrialization, urbanization, declining fertility, and differential migration patterns.

Invisible forms of labor such as family labor and neighbor labor were not only important but fundamental to family farms in the United States. Given the biases in the Census, researchers must use the data critically and not simply at face-value. Finally, new complete count data means we can control for spatial influences such as kin propinquity but more broadly the neighborhood. The decline in kin propinquity mirrored larger economic and demographic trends in the United States, and the estimates from this dissertation provide the first long-run estimates of kin propinquity.

Chapter 1: “Those Who Labour in the Earth”: A Literature Review of U.S. Agricultural and Demographic History

The historiography on U.S. agricultural, economic, and demographic history includes research on exchange labor and family labor, farmer mentalities, industrialization, biases in sources, and demographic transitions. The debate on market vs subsistence-based agriculture established that farmers engaged markets, but not solely as profit maximizers. Demographic transformations in the United States included industrialization, urbanization, declining fertility and later mortality, increased immigration from Europe, China, and Mexico, and changing living arrangements for younger generations and the elderly. New data and methods including complete count census data and panel data have provided new insights and reinforced previous findings. My dissertation addresses gaps in our understanding of exchange labor over the family life cycle, census biases for women’s and children’s occupational reporting in the Census, and kin propinquity in the United States.

MARKET VS. SUBSISTENCE AGRICULTURE

Two broad camps try to explain the emergence of agricultural capitalism from eighteenth-century family farms in the United States. During the 1970s, historians challenged notions that American farmers were always "capitalists," where families maintained local kinship patterns which outweighed individual profit maximization. These farmers practiced a moral economy where agricultural work provided the family with necessities via the self-sufficient farm.¹ The economic dimensions of the “moral economy”

¹ Michael Merrill. “Cash is Good to Eat: Self-Sufficiency and Exchange in the Rural Economy of the United States”. *Radical History Review* 4. 1977. 53; Allan Kulikoff. *The Agrarian Origins of American Capitalism*, (Charlottesville: University Press of Virginia, 1992), 14. James A. Henretta, “Families and Farms: Mentalité in Pre-Industrial America,” *The William and Mary Quarterly*, 35:1 (1978), 32.

are similar to Alexander Chayanov's *The Theory of Peasant Economy* written in 1925 and translated into English in 1966. Chayanov argued one of the fundamental misperceptions of peasant families was treating them as a business, whereas family farms relied on no outside labor, only the available labor from the family. Further, peasant farm profits and labor self-exploitation were driven by the size of the family and the ratio of working to non-working members.²

Alternatively, market historians focus on markets and surpluses, such as by the late eighteenth century, Massachusetts farm prices converged with New York City and Philadelphia, suggesting a market economy rather than simply a marketplace. By 1860, most northern farmers produced an average surplus to feed an additional four to eight people beyond the farm family household. Markets drove farmers to specialize, which stimulated further demographic and economic transformations such as declining fertility and investment in machinery rather than labor in the agricultural North. Market historians argue that the moral economy model does not adequately explain why farmers specialized production, and historical consumption and production patterns suggest most farms did not attempt or achieve self-sufficiency but oriented production towards markets.³ The transition from a moral economy to a market economy cannot be explained by an internal

² Alexander V. Chayanov (1925), *The Theory of Peasant Economy* ed. Daniel Thorner, Basile Kerblay, R.E.F. Smith (Homewood, IL: American Economic Association 1966), 8, 59. While specifically describing the Russian peasantry and not necessarily descriptive of the early U.S. farming experience, few U.S. agricultural historians have cited Chayanov in regard to a "pre-capitalist" agriculture in the United States. Chayanov's definition of family farms was very specific, defined as families who use only the labor of the family and do not hire any labor beyond the family for agricultural pursuits. Given exchange labor in the United States, this does not precisely fit the historical reality of family farms in the United States.

³ Winifred B. Rothenberg. *From Market-Places to a Market Economy: The Transformation of Rural Massachusetts, 1750-1850*. University of Chicago Press. 1992. 108; Jeremy Atack, & Fred Bateman. *To Their Own Soil: Agriculture in the Antebellum North*, (Ames: Iowa State University Press, 1987). 224; Lee A Craig, "The Value of Household Labor in Antebellum Northern Agriculture," *The Journal of Economic History*, 51:1 (1991), 67-81. John Demos (1970), *A Little Commonwealth: Family Life in Plymouth Colony*, 2nd ed., (New York: Oxford University Press, 2000).

mechanism where farmers chose to abandon their moral economies for market farms.

Moral economy supporters responded that the household mode of production was fully capable of transforming into a market economy. Specifically, farm families in New England intensified labor production as per the moral economy model. While this “self-exploitation” of family labor typically saw little to no economic growth, unimproved land and increased livestock raising actually led to increased labor productivity rather than diminishing marginal returns. Increased population pressure (because consumption patterns were maintained rather than declined) through the early nineteenth-century eventually led to women and children looking for work opportunities outside of agriculture, which provided an avenue that spurred agricultural and industrial capitalism.⁴

Other historians question the division of farmers into binary market/non-market categories. One model is the composite farm, where farmers produced and sold their commodities at markets, but also attempted some self-sufficiency and provided economic opportunities for their family on the family farm or on new lands elsewhere. An extension of the composite farm represented the moral economy model while maintaining the rational economic actor model employed by economists. This ambiguity is explained by focusing not on farmers maximizing profits but rather on farmers maximizing utility, shifting the household debate from one of production to one of consumption. This complicates the timing of when capitalism began to dominate agrarian society, but this

⁴ Christopher Clark, *The Roots of Rural Capitalism: Western Massachusetts, 1780-1860*, (Ithaca: Cornell University Press, 1990), 320. An extension of this is Claudia Goldin, & Kenneth Sokoloff, “The Relative Productivity Hypothesis of Industrialization: The American Case, 1820 to 1850,” *The Quarterly Journal of Economics*, 99:3 (1984), 461-487 who argued that relative wages of women and children to men were low which promoted industrialization in the northern states but not the southern states.

agricultural transformation began largely in response to the American Revolution.⁵ Focusing on whether farm families were primarily producers or consumers likely varied between time period, region, and even between farm families. Most farms produced commodities for markets, and focusing on consumption fails to emphasize this. A consumption narrative requires an explanation for why a farm family decided to consume their produce rather than sell it. Possible reasons include no market to sell a product, low prices for selling the product, high prices for buying the same product at market, and farmer mentalities regarding subsistence production.

Canadian historians have criticized the binary market and subsistence-oriented mentalities. Many farmers often combined market and subsistence agriculture, producing items for home consumption and purchasing similar consumer goods at the market. Documented cases include families who raised hogs yet purchased pork from the local general store. Almost all families relied on the general store and frontier areas were not immune to new consumer trends in nineteenth-century Canada. This opposes the narrative of the independent frontier farm family that relied only upon its own labor but were largely invisible to the market. On the contrary, Canadian frontier literature establishes that frontier farmers were well integrated with markets and relied on their own production and that of other families in the area.⁶

⁵ Richard Lyman Bushman, "Markets and Composite Farms in Early America," *The William and Mary Quarterly*, 55:3 (1998), 361, 364-365, 368, 371-372. John Mack Faragher, "History from the Inside-Out: Writing the History of Women in Rural America," *American Quarterly*, 33:5 (1981), 545, 551. Jeanne Boydston, *Home and Work: Housework, Wages, and the Ideology of Labor in the Early Republic*, (Oxford: Oxford University Press, 1990), 113, 117, 150-161. Naomi Lamoreaux, "Rethinking the Transition to Capitalism in the Early American Northeast," *The Journal of American History*, 90:2 (2003), 438, 449-450.

⁶ Béatrice Craig, *Backwoods Consumers and Homespun Capitalists: The Rise of a Market Culture in Eastern Canada*, (Toronto: University of Toronto Press, 2009), 21-22. Douglas McCalla, *Consumers in the Bush: Shopping Rural Upper Canada*, (Montreal: McGill-Queen's University Press, 2015), 11-14. An example of a U.S. frontier and consumerism is Ann Smart Martin, *Buying into the World of Goods: Early Consumers in Backcountry Virginia*, (Baltimore: John Hopkins University Press, 2008).

This distinction pushes the debate from a binary discussion of “market vs subsistence” to a more holistic debate about actual family farm practices. Farmers produced goods for the home, but also engaged with markets, and even after high market exposure still produced goods for the family. Similarly, exchange of labor historically was treated as a non-market phenomenon where farmers only utilized neighbors during times of suffering or in pre-market economies.⁷ Canadian literature and work on the exchange of labor in California challenge this theory. Specifically, neighborliness was often a product of mutual advantage that incorporated class, age, and gender differences while emphasizing property rights and social hierarchy. Neighbor exchange was used during times of economic necessity, but also reinforced local social mores and provided a form of insurance from future economic and demographic downturns.⁸

A fundamental aspect of American agriculture in the U.S. South revolved around the institution of slavery. Debates on slavery include its profitability, economic viability, macroeconomic growth, regional differences between the North and South to explain industrialization, slavery’s role in capitalism, slave marital patterns, and slave owners’ views on the future of slavery.⁹ Debates evolved around the productivity of slaves compared to free labor, specifically with Robert Fogel’s and Stanley Engerman’s *Time on*

⁷ Charles J. Erasmus, “Culture Structure and Process: The Occurrence and Disappearance of Reciprocal Farm Labor,” *Southwestern Journal of Anthropology*, 12:4 (1956), 466-467.

⁸ R. Todd Welker, “Neighborhood Exchange and the Economic Culture of Rural California in the Late Nineteenth Century,” *Agricultural History*, 87:3 (2013), 391-392,410-411. Catharine Anne Wilson, “Reciprocal Work Bees and the Meaning of Neighbourhood,” *The Canadian Historical Review*, 82:3 (2001), 463-464.

⁹ Sven Beckert, *Empire of Cotton: A Global History*, (New York: Alfred A. Knopf, 2015).

Charles W. Calomiris, & Jonathan Pritchett, “Betting on Secession: Quantifying Political events Surrounding Slavery and the Civil War,” *American Economic Review*, 106:1 (2016), 1-23. Goldin & Sokoloff (1984), 461-487. Trevon D. Logan, & Jonathan B. Pritchett, “On the Marital Status of U.S. Slaves: Evidence from Touro Infirmary, New Orleans, Louisiana,” *Explorations in Economic History*, 69: (2018), 50-63.

the Cross. Responses to *Time on the Cross* were wide-ranging and extremely critical.¹⁰ This dissertation largely deals with northern agricultural patterns and does not fully address regional differences with southern agricultural practices, especially after the Civil War and the end of slavery as a formal institution.

WOMEN'S WORK AND CENSUS BIAS

Women's labor during industrialization has been extensively studied by previous historians and economists. An early work on women's labor was Ivy Pinchbeck's *Women Workers and the Industrial Revolution*. For women in preindustrial England, the rise of wage laboring factory jobs provided opportunities to work outside of the household, but also pushed women to work within the domestic sphere with little to no income, forcing women to become dependent on their husband's income rather than partners of a family agricultural enterprise. Pinchbeck used a variety of sources including aggregated census returns to document the transition of women from agricultural work alongside husbands to industrial factories, but specifically mentions that census returns were not very accurate. Pinchbeck further alleges that most English women had transitioned out of agriculture by the end of the Victorian era.¹¹

Earlier literature focuses heavily on how economic and technological changes forced women out of agriculture, but other interpretations suggest that economic and

¹⁰ Robert William Fogel, & Stanley L. Engerman, *Time on the Cross: The Economics of American Negro Slavery*, (Boston: Little, Brown and Company 1974). Herbert G. Gutman, *Slavery and the Numbers Game: A Critique of Time on the Cross*, (Urbana: University of Illinois Press, 1975). Paul A. David, & Peter Temin, "Capitalist Masters, Bourgeois Slaves," *Journal of Interdisciplinary History*, 3: (1975), 445-457. Robert William Fogel, "Three Phases of Cliometric Research on Slavery and its Aftermath," *The American Economic Review*, 65:2 (1975), 37-46. Robert W. Fogel, & Stanley L. Engerman, "Explaining the Relative Efficiency of Slave Agriculture in the Antebellum South," *The American Economic Review*, 67:3 (1977), 275-296. Criticisms of *Time on the Cross* went beyond debates about productivity of slaves, but that debate is what matters most to my dissertation.

¹¹ Ivy Pinchbeck, *Women Workers and the Industrial Revolution, 1750-1850*, (New York: F.S. Crofts & Company, 1930), 110, 312, 317. K.D.M. Snell, *Annals of the Labouring Poor: Social Change and Agrarian England, 1660-1900*, (Cambridge: Cambridge University Press, 1985), 66.

technological changes worked in tandem with cultural changes and reinforced beliefs that women should work in the home.¹² While working in the home compared to wage labor was more efficient due to lower wages offered women, there was also an ideological shift that encouraged household work as the respectable place to work for women.¹³ More nuanced readings of these ideological spheres is that while separate spheres were encouraged, most families could not and did not achieve this, and in fact, family labor decisions were driven more by family needs than external industrial demand of labor and ideological demands.¹⁴

Historians have detailed women's work including seasonal agricultural work, home manufactures, butter making, and eggs.¹⁵ Women's work was often organized in conjunction with men's, where men controlled one aspect of the production process (such as raising livestock) while women controlled another (churning butter). As goods became highly commoditized, men slowly took over areas traditionally under women's management, and eventually commercialized the products in factories. Often, these shifts occurred when emerging markets produced grains more cheaply than established agricultural regions, forcing established regions such as New England to adopt more labor-intensive modes of production such as raising cows and making butter. With increased

¹² Nicola Verdon, *Rural Women Workers in Nineteenth-Century England*, (Rochester: The Boydell Press, 2002), 198. Alice Kessler-Harris, *Out to Work: A History of Wage-Earning Women in the United States*, (Oxford: Oxford University Press, 1982), 21. Nancy Folbre, "The Unproductive Housewife: Her Evolution in Nineteenth-Century Economic Thought," *Signs*, 16:3 (1991), 463-484. Claudia Goldin, *Understanding the Gender Gap: An Economic History of American Women*, (New York: Oxford University Press, 1990). Nancy Folbre, "Women's Informal Market Work in Massachusetts, 1875-1920," *Social Science History*, 17:1 (1993), 135-160.

¹³ Verdon (2002), 198.

¹⁴ Louise A. Tilly, & Joan W. Scott, *Women, Work, and Family*, (New York: Holt, Rinehart and Winston, 1978), 232.

¹⁵ Jeanne Boydston, *Home and Work: Housework, Wages, and the Ideology of Labor in the Early Republic*, (Oxford: Oxford University Press, 1990). Lu Ann Jones, *Mama Learned Us to Work: Farm Women in the New South*, (Chapel Hill: University of North Carolina Press, 2001). Sally McMurry, "Women's Work in Agriculture: Divergent Trends in England and America, 1800 to 1930," *Comparative Studies in Society and History*, 34:2 (1992), 248-270. Rachel Rosenfeld, *Farm Women: Work, Farm, and Family in the United States*, (Chapel Hill: University of North Carolina Press, 1985).

commercialization, men became more entrenched in the production process, pushing women out of the production of butter. The rise of creameries later moved butter production out of the home and into the factory, although home production of butter continued far into the twentieth-century.¹⁶

An important story of women's work involves occupational reporting in the Census. Because many women's occupations were seasonal or temporary, it is not clear that enumerators reported women with an occupation during seasonal unemployment. Biases on the role of "unproductive" labor in the home showed women not reporting an occupation. This ignored actual contributions of women on farms, especially as a joint enterprise with a spouse. These systemic biases were built from German social scientists and Victorian ideologies.¹⁷ Victorian ideology developed in response to separating the competitive environment of industrialized wage labor and the market from the home, which represented a sanctuary from the competitive world. Specifically, censuses altered definitions of gainful employment to devalue the contributions of women's household work. Gainful employment conflated social and economic meanings of work, and Victorian ideology encouraged men and women to work in separate spheres defined by their gender, which encouraged social occupational reporting at the expense of economic reporting. Despite these problems, it is important to note that Census returns remain one of our most important and useful sources for studying work and the labor force.¹⁸

¹⁶ Joan Jensen, *Loosening the Bonds: Mid-Atlantic Farm Women, 1750-1850*, (New Haven: Yale University Press, 1986). Joan M Jensen. "Butter Making and Economic Development in Mid-Atlantic America from 1750 to 1850," *Signs*, 13.4. 1988. 813-829. Sally McMurry, *Transforming Rural Life: Dairying, Families and Agricultural Change, 1820-1885*. (Baltimore: John Hopkins University Press, 1995).

¹⁷ Nancy Folbre, & Marjorie Abel, "Women's Work and Women's Households: Gender Bias in the U.S. Census," *Social Research*, 56:3 (1989), 545-569. Margo J. Anderson, *The American Census: A Social History*, (New Haven: Yale University Press, 1988).

¹⁸ Verdon (2002), 31-33. Edward Higgs, "Occupational Censuses and the Agricultural Workforce in Victorian England and Wales," *The Economic History Review*, 48:4 (1995), 700-716. Edward Higgs, and Amanda Wilkinson, "Women,

Land availability and railroad expansion in the West permitted extensive modes of agriculture and promoted growing urbanization, specifically in the Midwest.¹⁹ The introduction of canals and railroads created new transportation networks for farmers to take advantage of. While these networks gave farmers new markets to sell crops, they also pushed farmers into a dependent state on markets. Further innovations such as crop measurement standardization combined with railroad monopolies on prices hurt farmers, which led to political movements such as the Grange. After Theodore Roosevelt created the Commission on Country Life, state cooperative extension services were funded through the Smith-Lever Act of 1914. Extension services encouraged home economics training, new scientific agricultural practices, and funded time use studies of farm wives.²⁰

Agricultural markets still encouraged large extensive agricultural operations that led to unsustainable environmental practices. Sustainable practices such as crop rotation were heavily practiced in New England in the eighteenth century and encouraged by George Washington Carver in the South in the 1890s but largely ignored in the Great Plains.²¹ Industrialization further transformed the family structure of labor. New machinery relied less on the labor of women and children over time, and ideological spheres of work

Occupations and Work in the Victorian Censuses Revisited,” *History Workshop Journal*, 81: (2016), 17-38., Anderson (1988), 238-240.

¹⁹ William Cronon, *Nature's Metropolis: Chicago and the Great West*, (New York: W.W. Norton Company, 1991). Jeremy Atack, et al., “Did Railroads Induce or Follow Economic Growth? Urbanization and Population Growth in the American Midwest, 1850-1860,” *Social Science History*, 34:2 (2010), 171-197.

²⁰ Alfred Charles True, *A History of Agricultural Extension Work in the United States, 1785-1923*, (Washington, D.C.: U.S. Department of Agriculture, 1928). Lucy A. Studley, *Relationship of the Farm Home to the Farm Business: A Study in Cottonwood and Steele Counties, Minnesota*, University of Minnesota Agricultural Experiment Station, (1931). G.E. Wasson, *The Use of Time by South Dakota Farm Homemakers*, South Dakota State college of Agriculture and Mechanic Arts. Agricultural Experiment Station (1930). Maud Wilson, *Use of Time by Oregon Farm Homemakers*, Oregon State Agricultural College. Agricultural Experiment Station, (1929).

²¹ Brian Donahue, *The Great Meadow: Farmers and the Land in Colonial Concord*, (New Haven: Yale University Press, 2004). Steven Stoll, *Larding the Lean Earth: Soil and Society in Nineteenth-Century America*, (New York: Hill and Wang, 2002). Mark D. Hersey, *My Work is that of Conservation: An Environmental Biography of George Washington Carver*, (Athens: University of George Press, 2011).

encouraged women specifically to work within the home and not in the fields.²² Using less machinery, no crop rotation methods, and focusing on cash crops, unsustainable monoculture and heavy tilling of soil removing grassland led to the Dust Bowl, one of America's greatest ecological disasters. The Dust Bowl increased internal migration rates during the 1930s, showing the importance of environmental factors on demographic and economic outcomes.²³ Ideological, environmental, and economic changes affected women's work, which also altered family decisions around fertility and living arrangements.

DEMOGRAPHIC TRANSITIONS

Fertility decline in the United States differed regionally, but generally declined nationally after the Civil War.²⁴ While later than French fertility decline, the mechanisms of fertility decline in the United States were similar to European fertility decline, specifically where upper classes in Canada, Iceland, Norway, Sweden and the United States had lower net fertility than lower classes.²⁵ While socioeconomic factors were important in fertility differentials in the 19th and 20th century, cultural willingness via secularization

²² Jensen (1986), 54-56. Steven R. Hoffbeck, *The Haymakers: A Chronicle of Five Farm Families*, (Minneapolis: Minnesota Historical Society, 2000), 23. Ed. Lucy Leavenworth Wilder Morris, *Old Rail Fence Corners: Frontier Tales Told by Minnesota Pioneers*, (St. Paul: Minnesota Historical Society Press, 1976). Paul Conklin, *A Revolution Down on the Farm: The Transformation of American Agriculture since 1929* (Lexington: University Press of Kentucky, 2008). Jon Gjerde, *The Minds of the West: Ethnocultural Evolution in the Rural Middle West 1830-1917*, (Chapel Hill: University of North Carolina Press, 1997).

²³ Donald Worster, *Dust Bowl: The Southern Plains in the 1930s* (Oxford: Oxford University Press, 1979). Gutmann et al, Myron P. Gutmann, et al., "Migration in the 1930s: Beyond the Dust Bowl," *Social Science History*, 40:4 (2016), 707-740. Myron P. Gutmann, "Beyond Social Science History: Population and Environment in the US Great Plains," *Social Science History*, 42: 1 (2018), 1-27.

²⁴ J. David Hacker, "Rethinking the 'Early' Decline of Marital Fertility in the United States," *Demography*, 40:4 (2003), 605-620. J. David Hacker, "Ready, Willing, and Able? Impediments to the Onset of Marital Fertility Decline in the United States," *Demography*, 53: (2016), 1657-1692.

²⁵ Martin Dribe, et al. "Socioeconomic Status and Net Fertility during the Fertility Decline: A Comparative Analysis of Canada, Iceland, Sweden, Norway and the United States," *Population Studies*, 68:2 (2014), 135-149.

and ability via birth control methods to limit fertility lowered fertility rates in the United States were just as important.²⁶

Mortality in the United States in the nineteenth century did not decline steadily over the whole century. In fact, increases in mortality occurred in the mid nineteenth-century. Historians originally inferred a steady decline or assumed data quality was the problem, but new life tables and declining stature provide evidence that mortality increased after the 1830s and did not see steady declines until after 1870. Theories for increased mortality in the middle of the century include deteriorating diets, disease epidemics, industrialization, and increased income inequality. Declining child mortality formed the largest improvements in mortality.²⁷

Interstate migration was very high in the United States during the nineteenth and twentieth centuries.²⁸ Some of the largest interstate migrations were westward migrations from the original 13 colonies and the Great Migration of blacks from the south to northern cities.²⁹ International immigration from Europe, forced migration of blacks from Africa, labor migrants from Mexico, and immigration from East Asia all fueled US population growth.³⁰ International immigration was met with nativist responses that led to anti-

²⁶ Hacker, (2016), 1686.

²⁷ J. David Hacker, "Decennial Life Tables for the White Population of the United States, 1790-1900," *Historical Methods*, 43:2 (2010), 45-79. C.L. Pope, "Adult Mortality in America before 1900: A View from Family Histories," in *Strategic Factors in Nineteenth Century American Economic History: A Volume to Honor Robert W. Fogel*, ed. C. Goldin, & H. Rockoff, (Chicago: University of Chicago, 1992), 267-296. D.L. Costa, & R.H. Steckel, "Long-Term Trends in Health, Welfare, and Economic Growth in the United States," in *Health and Welfare during Industrialization* ed. R.H. Steckel, & R. Floud, (Chicago: University of Chicago Press, 1997), 47-89. Michael R. Haines, Lee A. Craig, and Thomas Weiss, "The Short and the Dead: Nutrition, Mortality, and the 'Antebellum Puzzle' in the United States," *The Journal of Economic History*, 63:2 (2003), 382-413.

²⁸ Patricia Kelly-Hall, & Steven Ruggles, "'Restless in the Midst of Their Prosperity': New Evidence on the Internal Migration of Americans, 1850-2000," *The Journal of American History*, 91: (2004) 829-846.

²⁹ Leah Boustan *Competition in the Promised Land: Black Migrants in Northern Cities and Labor Markets* (Princeton: Princeton University Press 2017).

³⁰ Katharine M. Donato, & Donna Gabaccia, *Gender and International Migration*, (New York: Russell Sage Foundation, 2015). Erika Lee, *The Making of Asian America: A History*, (New York: Simon & Schuster, 2015). Mae M. Ngai, *Impossible Subjects: Illegal Aliens and the Making of Modern America*, (Princeton: Princeton University

immigrant legislation, most notably the Chinese Exclusion Act of 1882 and the Johnson-Reed Immigration Act of 1924. Germans, Scandinavians, English, Polish, and other European groups formed a substantial minority of farmers in the United States (especially the Midwest) in the late nineteenth- and early twentieth-centuries. Differences between immigrant farmers and Yankee farmers existed, both in regard to inheritance and agricultural practices, but also in ideological battles over the ideal family farm and function.³¹

Living arrangements provide insights into the economic organization of families. Peter Laslett's classification of types of families remains a seminal work today and influences how we measure families, but just as importantly asserts that families were generally always nuclear in Great Britain since the seventeenth-century rather than extended with several types of kin.³² While greatly expanding the demographic historiography, the drawback of Laslett's method is the focus on household measures rather than individual measures. For example, multigenerational households appeared rarely in the U.S., based on Laslett's household measure. However, looking at elderly persons living with adult children shows a long-run decline through 1940 with a steep decline in intergenerational coresidence after 1950. This distinction changed our understanding of the demographic trends of the period. Rather than children primarily caring for elderly parents,

Press, 2004). Stephanie E. Smallwood, *Saltwater Slavery: A Middle Passage from Africa to American Diaspora*, (Cambridge: Harvard University Press, 2007).

³¹ Jon Gjerde, *From Peasants to Farmers: The Migration from Balestrand, Norway to the Upper Middle West*, (Cambridge: Cambridge University Press, 1985). Jon Gjerde (1997). R.C. Ostergren, *A Community Transplanted: The TransAtlantic Experience of a Swedish Immigrant Settlement in the Upper Middle West, 1835-1915*, (Madison: University of Wisconsin Press, 1988). Stephen Gross, "Handing Down the Farm: Values, Strategies, and Outcomes in Inheritance Practices Among Rural German Americans," *Journal of Family History*, 21:2 (1996), 192-217.

³² Peter Laslett, *The World We Have Lost* (New York: Scribner, 1965).

the long-run decline of intergenerational coresidence suggests a lack of wage opportunities for younger generations who instead remained at home.³³

Kinship bonds beyond the household were used for intergenerational support, marital alliances, and enforcement of social mores. Land availability and economic opportunities strengthened kinship bonds but also weakened them. Land availability promoted kin groups to migrate together, while lack of land prevented families from settling all of their children nearby or on the home farm. This and new economic opportunities drove children towards urban areas, which weakened kinship bonds. Inheritance practices did not generally encourage intergenerational accumulation, suggesting a mentality focused on strengthening the local network.³⁴

While the literature discusses meanings and applications of kinship, less is known about how common kin propinquity actually was. One of the earliest studies used a sample of the 1790 Census and 1900 Census to measure kin propinquity with surname matching. The study found in 1790 approximately 29.3% of heads of household lived near someone with the same surname and 14.6% of elderly persons in 1900 lived near someone with the same surname. The decline in kin propinquity was driven by declining fertility, economic transformations in the United States, and a changed cultural mentality among Yankee families to not live near kin over the nineteenth century.³⁵

³³ Steven Ruggles, "The Decline of Intergenerational Coresidence in the United States, 1850 to 2000," *American Sociological Review*, 72:6 (2007), 964-989. Steven Ruggles, "The Future of Historical Family Demography," *Annual Review of Sociology*, 38: (2012), 423-441. Brian Gratton, & Myron P. Gutmann, "Emptying the Nest: Older Men in the United States, 1880-2000," *Population and Development Review*, 36:2 (2010), 331-356.

³⁴ Carolyn Early Billingsley, *Communities of Kinship: Antebellum Families and the Settlement of the Cotton Frontier, 1750-1820*, (Princeton: Princeton University Press, 1986). Toby L. Ditz, *Property and Kinship: Inheritance in Early Connecticut, 1750-1820*, (Princeton: Princeton University Press, 1986).

³⁵ Daniel Scott Smith, "'All in Some Degree Related to Each Other': A Demographic and Comparative Resolution of the Anomaly of New England Kinship," *The American Historical Review*, 94:1 (1989), 71.

Common criticisms of isonymic matching include the measure is a crude representation of kinship, does not capture all forms of kinship, and does not expand our understanding of kinship.³⁶ While isonymic kin propinquity matching does not tell us the whole story of kinship, it does tell us an important aspect of kinship. Counting, one of the simplest methods, is one of our most powerful tools.³⁷ Estimating the number of people who had potential kin living nearby is important to changes kinship ties underwent during the nineteenth- and twentieth-centuries. Kin propinquity was even more important in 1790 than today in an age of horses, limited infrastructure, slow communication, and kin interaction significantly more likely than non-kin interaction.³⁸ Second, while most kin propinquity measures do not capture married women's kin groups, as pointed out by Daniel Scott Smith, "There is no perfect measure of kin density, but even if patterns cannot be measured perfectly they can still be measured meaningfully."³⁹

Finally, our understanding of kin networks expands even with these basic measures. Qualitative studies of kinship describe the mechanisms of kinship, but the focus on specific geographic areas because of interest or record availability can bias our arguments around kinship. As shown by Smith, a previous geographic focus on New England oversimplifies the role of kinship in 1790, when in fact there was a lot of variation in kin propinquity and (as an extension of the importance of kin propinquity in 1790) kinship practices.⁴⁰ While kin propinquity measures are crude representations of the meaning of kinship, the measures

³⁶ Smith (1989), 50. Billingsley 2004.

³⁷ Robert William Fogel, "The Limits of Quantitative Methods in History," *The American Historical Review*, 80:2 (1975), 337.

³⁸ Darrett B. Rutman, & Anita H. Rutman, *A Place in Time: Explicatures*, (New York: W.W. Norton & Company, 1984) 114. Smith (1989), 47.

³⁹ Smith (1989), 49.

⁴⁰ Smith (1989), 49-55.

reveal how kinship changed in the United States during the nineteenth-century, one of the largest economic, demographic, political, and cultural transformations in U.S. history.

BIG DATA AND NEW METHODS

In the last 30 years, new developments in quantitative methodologies and data changed how we analyze economic and demographic patterns. Starting with the first public use microdata samples for the Census in the 1970s, scholars used nationally representative census samples for the United States to measure fertility, migration, and living arrangements. Integration of the censuses and creation of relationship pointers by the Integrated Public Use Microdata Series (IPUMS) in 1993 reduced the cost of research and reproducibility of results, greatly expanding demographic and economic historical methods and research.⁴¹

Recent developments include the digitization and harmonization of complete count census data, GIS applications, and record linkage. New complete count censuses have been digitized by many entities worldwide. Canada, Denmark, Great Britain, Iceland, Norway, Sweden, and the United States have all released at least one complete count census in the past 15 years.⁴² For the United States, the 1880 Census was the first complete count census

⁴¹ Steven Ruggles, "Comparability of the Public Use Samples of the U.S. Census of Population, 1880-1980," *Social Science History*, 15: (1991), 123-158.

⁴² Lisa Dillon, 1881 Canadian Census project, North Atlantic Population Project, & Minnesota Population Center, *National Sample of the 1881 Census of Canada (version 2.0)*, Montréal, QC: Département de Démographie, Université de Montréal (distributor), 2008. Kris Inwood, & Chelsea Jack, *National Sample of the 1891 Census of Canada*, Guelph: Canada: University of Guelph, 2011. Nanna Floor Clausen, & Danish National Archives, *1787 Census of Denmark, Version 1.0*. Nanna Floor Clausen, & Danish National Archives, *1801 Census of Denmark, Version 1.0*. K. Schürer, & E. Higgs, *Integrated Census Microdata (I-CeM), 1851-1911*, [data collection], UK Data Service, 2014. Ólöf Garðarsdóttir, & National Archives of Iceland, *1703 Census of Iceland, Version 1.0*. Manntal á Íslandi, & Daniel Vasey, *1801 Census of Iceland, Version 1.0*. Ólöf Garðarsdóttir, & National Archives of Iceland, *1901 Census of Iceland, Version 2.0*. Ólöf Garðarsdóttir, & National Archives of Iceland, *1910 Census of Iceland, Version 1.0*. The Digital Archive (The National Archive), University of Bergen, & the Minnesota Population Center, *Census of Norway 1801, Version 1.0*, Bergen, Norway: University of Bergen, 2011. The Digital Archive (The National Archive), Norwegian Historical Data Centre (University of Tromsø), & the Minnesota Population Center, *National Sample of the 1865 Census of Norway, Version 2.0*, Tromsø, Norway: University of Tromsø, 2008. The Norwegian Historical Data Centre (University of Tromsø), & the Minnesota Population Center, *National Sample of the 1875 Census of Norway, Version 2.0*, Tromsø, Norway: University of Tromsø, 2008. The Digital Archive (The National Archive), Norwegian Historical Data Centre

released by IPUMS in 2008. 1850 was released in 2015 and IPUMS released preliminary versions of the remaining 1790-1940 censuses over the past 5 years.⁴³ These versions contain anonymous public versions as well as restricted versions with names and street addresses when available. Current projects that have leveraged the complete count data include interstate and international migration, environmental effects on demographic decisions, segregation, and red-lining policies.⁴⁴

Record linkage between censuses, vital registration records, and other surveys is not new to demographic and economic history.⁴⁵ However, previous record linkage in the United States focused on small populations because most data linkage was done by hand, and later with Soundex indexes. With the improvement in computing power over the last half century and complete count census data, automatic record linkage of censuses on a large scale is now possible. Projects such as the Multigenerational Longitudinal Panel (IPUMS-MPL), the Longitudinal Intergenerational Family Electronic Micro-Database

(University of Tromsø), & the Minnesota Population Center, *National Sample of the 1900 Census of Norway, Version 2.0*, Tromsø, Norway: University of Tromsø, 2008. The Digital Archive (The National Archive), Norwegian Historical Data Centre (University of Tromsø), & the Minnesota Population Center, *National Sample of the 1910 Census of Norway, Version 1.0*, Tromsø, Norway: University of Tromsø, 2011. The Swedish National Archives, Umeå University, & the Minnesota Population Center, *National Sample of the 1880 Census of Sweden, Version 2.0*, Minneapolis: Minnesota Population Center [distributor], 2014. The Swedish National Archives, Umeå University, & the Minnesota Population Center, *National Sample of the 1890 Census of Sweden, Version 2.0*, Minneapolis: Minnesota Population Center [distributor], 2011. The Swedish National Archives, Umeå University, & the Minnesota Population Center, *National Sample of the 1900 Census of Sweden, Version 3.0*, Minneapolis: Minnesota Population Center [distributor], 2011. The Swedish National Archives, & the Minnesota Population Center, *National Sample of the 1910 Census of Sweden, Version 1.0*, Minneapolis: Minnesota Population Center [distributor], 2016. Steven Ruggles, Katie Genadek, Ronald Goeken, Josiah Grover, and Matthew Sobek. *Integrated Public Use Microdata Series: Version 6.0* [database]. Minneapolis: University of Minnesota, 2015. Minnesota Population Center. *North Atlantic Population Project: Complete Count Microdata. Version 2.3* [dataset]. Minneapolis: Minnesota Population Center, 2017.

⁴³ Minnesota Population Center, & Ancestry.com, *IPUMS Restricted Complete Count Data: Version 1.0* [Machine readable database], (Minneapolis: University of Minnesota, 2013).

⁴⁴ Steven Ruggles, "The Future of Historical Family Demography," *Annual Review of Sociology*, 38: (2012), 423-441. Myron P. Gutmann, et al. "'Big Data' in Economic History," *The Journal of Economic History*, 78:1 (2018), 271-279.

⁴⁵ Merle Curti, *The Making of an American Community: A Case Study of Democracy in a Frontier County*, (Stanford: Stanford University Press, 1959). Joseph P. Ferrie, "A new sample of males linked from the public use microdata sample of the 1850 U.S. Federal Census of Population to the 1860 U.S. Federal Census Manuscript Schedules," *Historical Methods*, 29:4 (1996), 141-156. R.C. Kenzer, *Kinship and Neighborhood in a Southern Community: Orange County, North Carolina, 1849-1881*. (Knoxville: University of Tennessee, 1987).

(LIFE-M), and the Census Longitudinal Infrastructure Project (CLIP) among others are leveraging complete count census data to create new panel datasets that U.S. demographic and economic historians have only used previously as ad hoc data.⁴⁶

CONCLUSION

My dissertation is concerned with the labor of those typically ignored in the American exceptionalism narrative of Jeffersonian yeoman farmers. Women and children of the household are a part of this narrative, but so also are kin and neighbors beyond the household spheres. Since 1850, the United States underwent a large economic and demographic transformation which heavily affected agriculture. Industrialization and urbanization affected agricultural labor literally by pulling labor away from farms and ideologically by changing the value of women's, children's, and neighbor's labor.

Exchange labor was not only a part of the pre-market economy but often used in sync with the market economy. In many ways, historians have completely ignored exchange labor as a veritable form of labor of agricultural capitalism, largely because of the over-simplification of the market-subsistence debate. While Chapter 2 will not answer the question of the role of exchange labor in agricultural capitalism in the mid nineteenth-century, it will provide insights into family life cycle mechanisms of neighborhood exchange and the importance of exchange labor during times of low worker to consumer ratios for the farm family, an unexplored topic.

Many works focus on the transition from an agricultural society to an industrialized society and how it affected women's employment. A part of this conversation is some of the inherent biases in the Census on women's occupations and how those ideologies have

⁴⁶ Steven Ruggles, et al., "Historical Census Record Linkage," *Annual Review of Sociology*, 44: (2018), forthcoming.

developed. With the exception of Higgs on the British Censuses in the mid-nineteenth century, women's agricultural occupations in the Census have largely not been discussed except that the reports taken at face value are not accurate.⁴⁷ Specifically, we understand how gendered ideology led the Census to misreport women's agricultural work, but sociodemographic traits have not been explored fully. While ideological biases by Census designers has been discussed thoroughly, bias by enumerators, clerks and respondents has not been explored. Further, most studies of children's labor in the Census focuses on industrialization, compulsory education, and child labor laws, ignoring agricultural child occupational returns in the Census.⁴⁸

Currently, we have an estimate of kin propinquity from a 1790 sample and a 1900 sample with a lot of suggestive but incomplete evidence in between.⁴⁹ Since that paper was published, three more censuses have been publicly released (1920-1940). What has happened to kin propinquity since 1900? What happened between 1790 and 1900? Chapter 4 looks at kin propinquity using newly described complete count census data and extends the time series to 1940. The results also suggest some reasons for the decline of kin propinquity.

⁴⁷ Higgs (1995), 713.

⁴⁸ Carolyn M. Moehling, "State Child Labor Laws and the Decline of Child Labor," *Explorations in Economic History*, 36:1 (1999), 72-106. Carolyn M. Moehling, "Family Structure, School Attendance, and Child Labor in the American South in 1900 and 1910," *Explorations in Economic History*, 41:1 (2004), 73-100.

⁴⁹ Smith (1989), 68.

Chapter 2: Improving the Big Woods: Andrew Peterson's Family and Neighbor Labor in Nineteenth-Century Minnesota

Sophie Bost, a French-Swiss pioneer from Minnesota, wrote in a letter home to France that “Theodore has not been able to find a hired man at a reasonable price and is doing all the spring work by himself, apart from a little help (with sowing the wheat) from our neighbor Mike.”¹ Around the same time, her husband Theodore wrote “Here the great thing is to pay for things with what you can produce on your own farm and sell [your crops] for cash.”² In his diary in October 1845, William R Brown wrote “Martha made a pot of soap, used 22 lbs Tallow in makeing it. Charles & I. Daubed the Hen House. Bridsette took his Prairie Plow away. Belland sent for his ox yoke.”³ Andrew Peterson recorded in his diary on March 2, 1863, “Mended boots for Andrew and he hauled rails.”⁴ In these letters home and matter-of-fact diary entries, the Bosts, Brown, and Peterson articulated different forms of agricultural labor.

Family and neighbor labor did not appear clearly in other sources such as the Census. Underreporting women and children's labor and with little interest in measuring unpaid labor between families, the Census does not provide an accurate snapshot of all agricultural labor. Andrew Peterson recorded in his extensive 43-year diary how the labor of neighbors, women, and children varied based on the family life cycle. Measuring the labor contributions of different groups, I describe the trends of different forms of labor and their meaning within the Peterson family life cycle. Social networks bonded communities

¹ Theodore Bost, Sophie Bost, tr. Ralph Henry Bowen. *A Frontier Family in Minnesota: Letters of Theodore and Sophie Bost, 1851-1920*, (Minneapolis: University of Minnesota Press, 1981), 228.

² Bost, et. al. *A Frontier Family in Minnesota*. 173.

³ William R. Brown. *Minnesota Farmers' Diaries*. ed. Rodney C. Loehr. St Paul: Minnesota Historical Society. 1939.

⁴ Andrew Peterson, and Emma M. Ahlquist (tr). *Andrew Peterson and Family Papers 1850-2007*, (St. Paul, Minnesota Historical Society), 120.

together, and in Peterson's case, social networks of neighborhood exchange supplemented low labor supply during the early family life cycle. While the diary is limited by not describing Elsa's work within the household and the lack of hours of work, the diary is a rich resource to describe alternative forms of labor not captured in the Census. For Andrew Peterson's family, male neighbor labor made up the primary labor force beyond their household through the family's first 12 years in Minnesota. The use of male neighbor labor even after hiring labor and increased children's labor suggests neighbor labor was not simply a frontier response, but a supplement to a lack of family laborers and reinforcing community bonds.

NEIGHBOR LABOR AND TIME-USE STUDIES

In a study of neighborhood exchange in nineteenth-century California, R Todd Welker uses farm diaries from William Edwards to discuss the mechanisms for exchanging labor, capital, and goods among farmers. Edwards distinguished in his diaries between "letting" equipment where he charged money for renting compared with "lending" where he did not collect any money or debts owed. Most farmers during the time period comfortably used formal exchanges in the marketplace and informal exchanges between neighbors, depending on the context and necessity of the particular work pursued. Welker argues that Edwards' reliance on neighborhood exchange gradually decreased as time went on, attributing this to profitable years by Edwards, although Welker does not discuss whether the disintegration of personal networks or the individual life course plays a role in declining networks.⁵

⁵ R. Todd Welker. "Neighborhood Exchange and the Economic Culture of Rural California in the Late Nineteenth Century." *Agricultural History* 87:3. 2013. 391-392,410-411.

George Pond studied the organization of work on Southwestern Minnesota farms in 1923, focusing on the exchange of labor. Pond described how during specific periods of time, usually limited to two or three days, the usual supply of labor was not sufficient, and hiring the necessary labor either prohibitively expensive or not available. The tradition of exchanging labor was a solution to this problem. Specifically, in the case of one farm, 368 hours of exchanged labor over four days of work plus an additional 31 hours over 5 days for silo-filling were necessary. These 399 total hours were eventually repaid by this farmer when he performed 401 hours of work for these neighbor exchanges over 40 days. The exchange of labor allowed farmers to redistribute their labor in a manner that allowed them to fulfill labor supply shortages without the expense of hiring labor. While the majority of the exchanged labor supplied to the farmer occurred within several months (August-October), this farmer exchanged labor at other farms throughout the entire year.⁶

The agricultural extension service promoted research into time use and labor application studies at the micro-level like Pond's research. During the 1920s, time use studies focused on small samples of farmers from specific communities to explain divisions of labor and provide various policy suggestions. These studies suffered from the same issues I raise regarding separation of labor within the household and labor within the farm. While different authors argued that the two areas of labor are intertwined and a farm cannot run without household labor and agricultural labor, many of these studies focused on one "sphere" of labor. Some studies even deplored the labor of women in anything but

⁶ George A. Pond & Jesse W. Tapp, *A Study of Farm Organization in Southwestern Minnesota*, University of Minnesota, Agricultural Experiment Station, (1923), 101-103.

the household.⁷ Typically, the results from “farm” labor studies showed the contributions of women and children were relatively small. These numbers were further reduced when the numbers were adjusted for “adult-equivalent” labor, but also recognized that the contribution of women and children freed the male farmer from other farm work. In terms of household work, the male farmer contributed relatively little. Work such as “Preparing Fuel” were calculated as household work (a necessity) but “Cooking” is not (also a necessity).⁸

Luckily, homemaker studies were not absent from this research agenda. Different studies measured the labor contributions of women homemakers (almost always the wife of the farmer) towards the home. One South Dakota study concluded that women spent on average 66 hours per week working of which 54 of those hours were spent in the home. Women spent nearly 50% of their homemaking time on providing food for the family. While the average time spent in farm work amounted to 11 hours per week, homemakers gave significantly more time to farm work in the spring and fall.⁹

Similar results were found in an Oregon study, where homemakers worked an average of 64 hours per week, of which 52 hours were spent in the home. The Oregon report stated that “Homemakers constitute the largest occupation group in the population.”¹⁰ This report clearly articulated the role of the homemaker on the farm, a fact not duly recognized in the Census. In the Oregon report Maud Wilson stated “If the

⁷ Carle C. Zimmerman, & John D. Black, *How Minnesota Farm Family Incomes are Spent: An Interpretation of One Year's Study, 1924-1925*, University of Minnesota, Agricultural Experiment Station, (1927), 48-49.

⁸ Lucy A. Studley, *Relationship of the Farm Home to the Farm Business: A Study in Cottonwood and Steele Counties, Minnesota*, University of Minnesota, Agricultural Experiment Station, (1931), 4, 14, 18, 20.

⁹ G.E. Wasson, G.E. *The Use of Time by South Dakota Farm Homemakers*, South Dakota State College of Agriculture and Mechanic Arts. Agricultural Experiment Station, (1930), 6-8.

¹⁰ Maud Wilson, *Use of Time by Oregon Farm Homemakers*, Oregon State Agricultural College, Agricultural Experiment Station, (1929), 9.

homemaking of today is to be ‘unhampered by the traditions of the past,’ prospective homemakers must be taught to assign time values to all activities suggested for the homemaker by tradition, custom, or science.”¹¹ This focus on improved housemaker efficiency was largely tied to poor utility access and limited household technologies, even though the report states that the difference between farm and town homemakers time management was largely due to work outside of the farm.¹²

A survey of 892 “Farmer’s Wives” in 1923 came to similar conclusions. For example, 120 letters stated a similar concern that “Conveniences in the country home are needed.”¹³ Associated with this is the house work on the farm. One woman wrote how “It is only three weeks since my baby was born, and yet I must do all my house work.”¹⁴ In a very telling discussion on work in the field and the gendered spheres of work, Lindquist wrote

Forty letters indicate that women work in the field. “A woman can not work with her husband outside, and do her duty to her children as she should.” “We can’t afford to hire a man, and my husband has to have some one to help him in the field. I don’t like to neglect my house and my children, but there is no choice.” Farming can not be very promising when we find so many women doing the work of a man, but, since many blame themselves for tolerating these conditions, this may be one activity which can be avoided. The best interests of the community can not be conserved, if this is the common practice.¹⁵

Lindquist posited this field work not only in the gendered spheres ideology, but more broadly within the community. Further, the quotes he chose to support this position

¹¹ Ibid, 9.

¹² Ibid, 5.

¹³ G.A. Lundquist, *What Farm Women are Thinking*, University of Minnesota, Agricultural Experiment Stations, (1923), 5.

¹⁴ Ibid, 11.

¹⁵ Ibid, 16.

show that the women hold this gendered view of separation of work as much as the men. Later, Lindquist expanded that many woman (370) looked upon the rural church as the center point of the community. Farm women expressed this divinity within views such as being close to nature (420) and how “God made the country, and man made the city.”¹⁶

BRIEF HISTORY OF MINNESOTA 1850-1880

The Minnesota Territory was first organized by the United States in September 1849. With aspirations to “open” the land and expand the few settlements already in place, the Treaty of Traverse des Sioux and the Treaty of Mendota were signed by United States commissioners and the chiefs of the Sisseton, Wahpeton, Mdewakanton, and Wahpakoota bands in 1851. While payment as assigned in the treaties by the United States to the different Indian bands were delayed or misappropriated, the two treaties effectively opened up Minnesota for large-scale white settlement. Minnesota obtained statehood in the United States on May 11, 1858.¹⁷

Minnesota is broadly separated into four ecological areas: the Prairie Parkland, Eastern Broadleaf Forest, Tallgrass Aspen Parkland and the Laurentian Mixed Forest. The Eastern Broadleaf Forest, more popularly described as the “Big Woods” by Laura Ingalls Wilder, had the highest population and improved acre densities in Minnesota in the nineteenth century.¹⁸ The transformation from woodlands to improved farmsteads in the “Big Woods” proved extremely challenging, taking as long as 20 years to convert forests

¹⁶ Ibid, 4, 22

¹⁷ Edward Neill, & Charles Bryant, *History of the Minnesota Valley: Including the Explorers and Pioneers of Minnesota*, (Minneapolis: Minnesota Historical Company, 1882), 167-168, 180-181. Susan Granger, & Scott Kelly, *Historic Context Study of Minnesota Farms, 1820-1960 Vol I*, Minnesota Department of Transportation, (2005).

¹⁸ Minnesota Department of Natural Resources, “Ecological Provinces of Minnesota,” (2000), http://files.dnr.state.mn.us/natural_resources/ecs/province.pdf. U.S Census Bureau, “Population Density, 1860,” Prepared by Social Explorer.

into a large farm.¹⁹ During harsh Minnesota winters however, forests provided a source of fuel and building materials. Sophie Bost described in a letter to her sister-in-law in 1860,

Imagine to yourself a man in the middle of a dense forest which he has to clear. Tree after tree falls under his ax; some are used to build his house, and from the others he splits rails to build his fences; most of them are put in piles to be burned and removed...then you harrow it...and the pioneer grows rich with his fine fields and abundant harvests. Now you understand why the first years are so hard... he doesn't even have time to think about making sugar in the spring or to plant fruit trees. No, he must clear land, he must break the soil, and even in the event that the first crops don't turn out particularly well, he has confidence- first of all in God, and then in the future, to reward him for his efforts. I've been telling you about the woodland, but there are also open prairies where there are no trees, hence no difficult clearing to be done, but by the same token no wood to burn in winter, no sugar, no shade, no shelter! I like the woods better, but then, I'm not the one who chops down the trees!²⁰

With the failure of the Ohio Life Insurance and Trust Company in 1857 and rampant land speculation in the western United States, the resulting panic led to a depression of farm prices and land values which hurt Minnesota in particular, as Minnesota just opened up for broader white settlement in the early 1850s.²¹ Theodore Bost of Chanhassen, MN wrote in a letter to his parents in February 1859 that

The business outlook is still very dark for us Minnesotans. This makes me sorry for you, dear Parents; after drawing for you so attractive a picture of Minnesota, it is painful for me not to be able to send you better news. The frightful rise in land prices having stopped, or rather collapsed, all the investors have withdrawn their capital from the territory, so at the moment we are in a bad slump. However, the capitalists will soon see that they can make more money and do the country more good by setting up manufacturing of all kinds. We have magnificent pasturage for sheep, but since there are no woolen mills, nobody raises any. We have magnificent forests containing all sorts of wood, but no barrel factories, wagon factories,

¹⁹ Steven R. Hoffbeck. *The Haymakers: A Chronicle of Five Farm Families*. 23. Lucy Leavenworth Wilder Morris, *Old Rail Fence Corners: Frontier Tales Told by Minnesota Pioneers*, (St. Paul: Minnesota Historical Society Press, 1976).

²⁰ Bost, et al. (1981), 159.

²¹ Charles W. Calomiris and Larry Schweikart, "The Panic of 1857: Origins, Transmission, and Containment," *The Journal of Economic History*, 51:4 (1991), 809.

etc...²²

The Panic of 1857 ended with the beginning of the American Civil War in April 1861 which brought about an economic recovery by increasing the demand for wheat, corn and oats. In the midst of the Civil War, the Dakota Conflict began in central Minnesota in August 1862, when four Dakota hunters killed five white settlers. The Dakota Conflict's origins go back to the original treaty signings of Traverse des Sioux and Mendota. The United States government agreed to pay the tribes a set amount of money and provide food, supplies, and land to the signing tribes. However, corruption and broken promises led to the United States not making payments as promised, which resulted in increased tensions between the Dakota and white settlers. After the initial attack, the Dakota attacked white farms and settlements over the next several months. In his diary, Andrew Peterson wrote on August 20, 1862 "We had an Indian scare and fled out on the island in Clearwater Lake."²³ Four days later, the community discussed forming a volunteer force to fight the Dakota tribes, but ultimately decided to wait for further instruction from the state government. After writing that tensions about potential Dakota conflicts had diminished by September 7, Andrew wrote nothing more regarding the conflict. The uprising continued for the next several months, ending with the execution of 38 Dakota men on December 26, 1862- the largest mass execution in United States history.²⁴

The American Civil War affected the community directly in 1863 with the drafting of men for the army. Men could avoid the draft by providing a substitute or paying \$300.

²² Bost, et al. (1981), 134.

²³ Peterson, and Ahlquist (tr). (2007), 111.

²⁴ James M. McPherson. *Ordeal by Fire: The Civil War and Reconstruction*. Boston: McGraw Hill. 3rd Ed. 2001. 139-153. Duane Schultz, *Over the Earth I Come: The Great Sioux Uprising of 1862*, (New York: St. Martin's Press, 1992), 5, 8-12, 20. Peterson, and Ahlquist (tr). (2007), 138, 142-143.

When drafts were announced, meetings were held in Scandia to raise money for families and provide substitutes for people whom were drafted but did not wish to go to war. Peterson, too old to be drafted, spent some of his time at his neighbor's, Per Daniel's farm while Per Daniel fought in the war in 1864 and 1865.²⁵

In the 1870s, the United States agricultural economy suffered lower prices in the post-Civil War period, high prices for shipping goods to markets, and the grasshopper plagues of the 1870s.²⁶ The grasshopper plagues were an adversary in various works of fiction such as Laura Ingalls Wilder's *On the Banks of Plum Creek*. In her autobiography, Wilder described how "We raised our faces and looked straight into the sun. It has been shining brightly but now there was a light colored, fleecy cloud over its face so it did not hurt eyes. And then we saw that the cloud was grasshoppers."²⁷ In a similar account, Andrew Peterson described in August 1876 on "The 19th the grasshoppers began to come and since then more have come each day. By the 31st, the air was so full of them that when you looked at the sun, it looked as if it was snowing."²⁸ From *The Settlers*, Vilhelm Moberg wrote "Then, about harvest time, came the locust plague. There had been no grasshoppers in Minnesota since 1849, and the settlers were in hopes they would never return. One day, however, they appeared in immense, ravenous swarms. Like a rain of living black-gray drops they fell over the earth."²⁹

²⁵ National Archives and Records Administration (NARA); Washington, D.C.; *Consolidated Lists of Civil War Draft Registration Records (Provost Marshal General's Bureau; Consolidated Enrollment Lists, 1863-1865)*; Record Group: 110, NAI: 4213514; Archive Volume Number: 3 of 4. James McPherson, *Battle Cry of Freedom: The Civil War Era*, (Oxford: Oxford University Press, 1988), 600-601,604,758.

²⁶ Neill and Bryant (1882), 357, 381, 396. Bost, et al. (1981), 285-286; Christopher Hanes, "Wholesale price indexes, by commodity group: 1749-1890 [Warren and Pearson]." Table Cc113-124 in *Historical Statistics of the United States, Earliest Times to the Present: Millennial Edition*, ed. Susan B. Carter, Scott Sigmund Gartner, Michael R. Haines, Alan L. Olmstead, Richard Sutch, & Gavin Wright, (New York: Cambridge University Press, 2006).

²⁷ Laura Ingalls Wilder, *Pioneer Girl: The Annotated Autobiography*, ed. Pamela Smith Hall, (Pierre: South Dakota Historical Society Press, 2014), 79.

²⁸ Peterson, and Ahlquist (tr). (2007), 342.

²⁹ Vilhelm Moberg (1961), *The Settlers*, tr. Gustaf Lannestock, (Reprint, St. Paul: Borealis Books, 1995), 589-590.

The grasshopper plagues of the 1870s represented one of the largest crises in Minnesota history. Private charity and state aid to help out farmers with no harvests because of the plagues found limited success. The Minnesota legislature debated whether to compensate farmers by requiring additional work, bounties on grasshoppers, or seed and food to replant and survive. By the late 1870s, the plagues largely ended with only minor local occurrences of grasshoppers. Gilbert Fite discussed how families wrote to Minnesota's governor for additional assistance, and often referenced being unable to help neighbors. Other than legislators concerned about state aid encouraging laziness and dependence, most letters tend to cite the inability of neighbors to care for each other and in particular, widows, elderly persons or children starving due to a lack of aid.³⁰

NEIGHBOR LABOR EXCHANGE IN MINNESOTA

Family values about neighbor labor exchange as a complement to family and hired labor can be seen through the letters and diaries of farm families in the 19th century. Theodore Bost migrated to Carver County, Minnesota in November 1855. During his time in Minnesota, he and his future wife Sophie wrote several letters back home to family in France and Switzerland through the 1880s. The Bosts discussed major events and their daily life in these letters, including the labor and tasks involved on the farm. While some of the letters were ambiguous regarding hired labor and exchanged labor, other times Theodore distinguished between the two forms. Theodore hired unnamed laborers in July 1860 whom he paid with honey, livestock and grain. An example of neighbor labor exchange for Bost occurred in September 1860 where Theodore shocked his wheat with a

³⁰ Gilbert Fite, "Some Farmers' Accounts of Hardship on the Frontier," *Minnesota History*, 36: (1961), 205-211. Walter N. Trennery, "The Minnesota Legislator and the Grasshopper, 1873-1877," *Minnesota History*, 33: (1958), 56-61.

man named Sarver and the next day, helped Sarver stack hay. The Bosts were in debt to their parents for hundreds of dollars for several years but used the money to pay for hired labor throughout the 1860s.³¹

When Theodore worked with neighbors, he named his neighbors such as Sarver and Powers, but Theodore never named the wage laborers. For the Bosts, exchanging labor and livestock with local neighbors complemented household and wage labor. Theodore aspired for economic independence, expanding the farm to pay back debts and live more comfortably. In April 1860, the Bosts attempted to hire a workman to clear more land, but “all of the available young men had already found jobs, so we shall simply press forward under God’s protection”.³² In cases such as this, the Bosts did not rely on neighbor labor. The reasons for this are unclear, although Sophie and Theodore both offer suggestions in their letters.

Referring to older settlers whom had lived in the immediate area longer, Theodore wrote in a letter back home in June 1856

I can see that this year I’m going to have to do what many newcomers do –be satisfied to watch my neighbors enjoy their large, rich fields. I haven’t yet been able to get my field plowed and have only an acre and a half planted. If it pleases God, I’ll be able to plow two acres this week and plant them to potatoes and buckwheat. It takes four yokes of oxen to break the land and tear up the roots of small trees, and the older “*settlers*” have made arrangements this past year to help one another; the new settlers don’t yet have any oxen and so have to be content with admiring other people’s fields. That causes me more pain on your account than on my own because I’ll have enough to live on if I buy meat with what I can grow on my one and one-half acres, and I’ll have more time to work on my house and get more land ready for planting next year.³³

³¹ Bost, et al. (1981), 167-169.

³² Ibid. 156.

³³ Ibid. 94. Italicized words were written in English rather than French in the original letter. Underlined words were underlined in the original letter. Théodore Bost, et al., *Les derniers puritains, pionniers d'Amérique, 1851-1920: lettres de Théodore Bost et Sophie Bonjour*, (Paris: Hachette, 1977), 78.

Theodore suggests these established farmers excluded new farmers such as himself, and he could not borrow from other recent migrants because they did not have livestock. Older settlers' livestock were already exchanged for work, thus not available to lend to Theodore. Community, while binding local neighbors together, excluded others. In November 1856, Bost came upon a community of Swedish Baptists, including Andrew Peterson.

Andrew Peterson, born in Sweden in 1818, provided a unique account of his time in Minnesota. Andrew Peterson first migrated to the United States in 1850. Many Swedes migrated for better economic opportunities or religious persecution due to the enforcement of the Konventikelplakatet of 1726.³⁴ Peterson migrated to Burlington, Iowa, for the former reason as he was not baptized within the outlawed Baptist community until 1854. After a community Lutheran/Baptist split in 1854, Peterson migrated with several neighbors north to Scandia, Minnesota, on the western edge of the Big Woods. It is unclear whether this group migration was religiously based, as there is evidence that Peterson planned on migrating north to Minnesota before his religious conversion. Peterson was unique as an immigrant in that his familial ties to the church ensured he received a better education than most Swedish farmers.³⁵

After his migration to the United States in 1850, Peterson recorded his daily life in a diary and account book. This diary contains records of over 43 years of daily life from the age of 36 until Andrew's death in 1898 at the age of 79. Peterson represents an

³⁴ David Eric Jessup, "The Language of Religious Liberty in the Swedish Constitution of 1809," *Scandinavian Studies*, 82:2 (2010), 176-180. Josephine Mihelich, *Andrew Peterson and the Scandia Story: A Historical Account about a Minnesota Pioneer Whose Diaries have been "Reborn as a piece of world literature" through Wilhelm Moberg and his writings*, (Ford John Graphics, 1984), 127.

³⁵ Heidi Gould, "Peterson, Andrew (1818–1898)." June 28, 2013, accessed February 4, 2016, <http://www.mnopedia.org/person/peterson-andrew-1818-1898>. Mihelich (1984), 10-13.

interesting historical figure because of his "average" economic output while having his records preserved due to his contributions towards Minnesota pomology, the study of apples. For instance, in 1860 Peterson produced within one standard deviation of all measures from the agricultural census within Carver County except number of cattle owned and molasses. While relatively more successful in 1870 with slightly higher farm values and production rates than other farmers, Peterson's agricultural production is close to an average farmer in Carver County. Because of his reputation as a renowned horticulturalist, Peterson's diaries were preserved. These diaries provided the details that Vilhelm Moberg used to create Karl Oskar, the main protagonist of *The Emigrants* tetralogy. Recently, a musical "Andrew Peterson: The Genuine Pioneer Story" premiered in Sweden based on Andrew Peterson's diaries.³⁶

Included in these accounts were records of who owed Andrew work and vice versa. In the early years, work primarily comprised of building homes and barns, but later transitioned to breaking land, gathering hay and threshing wheat. Peterson discussed on May 11, 1857, how Jonas Peter harrowed his wheat field and the very next day, Andrew went to Jonas Peter's and grubbed to pay for his harrowing.³⁷ In a more detailed entry on November 28, 1856 Peterson wrote

I borrowed Jonas Broberg's oxen to haul logs for the fence on the other side of the maple. Alfred was also here with his oxen and hauled logs. He owed me two and a half days work, one day I counted off for the oxen and the half day I counted off for the sinkers he made for the seine and the mending of the net. In the evening Nilsson and I settled our account for the last period

³⁶ The calculations used data entered from the 1860 and 1870 agricultural censuses. Data available upon request. Matt Nelson. *Manuscript Censuses of Population and Agriculture for 1860 and 1870: Carver County, Minnesota*. 2010. Vilhelm Moberg. *The Emigrants*, 1951, Tr. Gustaf Lannestock. (Reprint, Borealis Books, St. Paul, MN, 1995). Vilhelm Moberg. *Unto A Good Land*, 1954, Tr. Gustaf Lannestock. (Reprint, Borealis Books, St. Paul, MN, 1995). Moberg (1961). Vilhelm Moberg. *The Last Letter Home*, 1961, Tr. Gustaf Lannestock. (Reprint, Borealis Books, St. Paul, MN, 1995).

³⁷ Peterson, & Ahlquist (tr). (2007), 33-34. 30.

of boarding and the six and a half days of work I had done during that.³⁸

In these account books, Andrew Peterson recorded these labors and crossed out entries of labor as he settled accounts with other farmers. Peterson wrote whether he exchanged labor, measured in days, money, or commodities to pay for different exchanges of neighbor labor. Peterson used this method of crossing out entries when the accounts were “made” until July 1876. Peterson then switched to the traditional debit and credit style of accounting at this time, reflecting a shift in Peterson’s approach to neighborhood exchange. Whether due to success, the family life cycle, or the changing economic climate of Minnesota, Peterson relied on his sons and paid for labor rather than exchanging it. While Andrew still worked at neighboring farms, it is clear that over the 1870s his work at nearby farms declined.³⁹

Peterson followed Theodore Bost’s strategy of hiring labor and paying with money or goods. Peterson wrote in the names of almost all workers, even laborers he paid in cash.⁴⁰ This reflects differences in the type of sources (letters vs. account books) but also values of the two farmers. While Peterson did not work exclusively with Swedes, the majority of his work outside of his family largely remained within the religious-ethnic community that grew around and with him. Bost worked with many neighbors whom were American or British as Bost lived in the United States for several years and had already learned English. Peterson, on the other hand, learned English with local Swedes at weekly

³⁸ Ibid. 30.

³⁹ Andrew Peterson, and Emma M. Ahlquist (tr). *Andrew Peterson and Family Papers 1850-2007, Cash Account Books*, St. Paul: Minnesota Historical Society, 2007.

⁴⁰ Occasionally, Peterson will name the laborer based on geography such as “the German” or “the Dalecarlian.” He also referenced individuals based on kinship such as “Broberg’s son” or “Carl’s wife.”

language meetings.⁴¹

The roles of these social networks should not be overemphasized or considered as complete substitutes for family or women's labor on the farm. Theodore Bost wrote

I ought to get married, and the sooner, the better. I am very happy as I am at present, but all these little household chores take a great deal of time-time that could be devoted to men's work. It doesn't make so much difference in the winter, but in the summer when I'll have the cows, pigs, hens, etc., to take care of, it will be more inconvenient, and if I could find a good, strong girl to marry, I would be relieved of these little chores and my outlay for food wouldn't be much greater, while there would be big savings in other respects.⁴²

In Andrew Peterson's account book, Peterson recorded his wife Elsa's work in the fields, but failed to mention Elsa's housework. There was an absence of information in Peterson's diaries about "female spheres" of the family farm. For example, Peterson sold eggs and butter, but never described the production of eggs and butter in his diary, suggesting that Elsa and his children were responsible for this work. This follows the generalization of nineteenth century dairy production where men were responsible for the care of the animals while women and children were responsible for milking cows and producing butter.⁴³ While domestic housework to Peterson and Bost was a part of the "women's sphere", women were not excluded from "male" farm work. This largely reflects the historiography of previous work on the roles of farm women and farm work in the pre-World War II era.⁴⁴

⁴¹ Peterson, and Ahlquist (tr). (2007), 32; Bost, et. al. (1981), 70, 140. David E Schob, *Hired Hands and Plowboys: Farm Labor in the Midwest, 1815-1860*, (Urbana: University of Illinois Press, 1975).

⁴² Bost, et. al. (1981), 74.

⁴³ Joan Jensen, *Loosening the Bonds: Mid-Atlantic Farm Women, 1750-1850*, (New Haven: Yale University Press, 1986). Joan M Jensen, "Butter Making and Economic Development in Mid-Atlantic America from 1750 to 1850," *Signs*, 13:4 (1988), 813-829.

⁴⁴ Peterson, and Ahlquist (tr). (2007), 63-130, 228. Nancy Grey Osterud, *Bonds of Community: The Lives of Farm Women in Nineteenth-Century New York*, (Ithaca: Cornell University Press, 1991). Jane Marie Pederson, *Between*

Farmer diaries alluded to the exchange of labor and capital alongside commodities in lieu of or in tandem with monetary exchange. This exchange is well documented in the historiography, but often considered as a pre-capitalist form of exchange that slowly disappeared with the rise of market agriculture. The problem with this argument is that agriculture did not follow a clear pre-determined path of economic development.⁴⁵ On the contrary, agriculture in the United States followed different paths regionally. Additionally, farmers did not achieve complete self-sufficiency. Many farms were composite farms, both engaged with markets and producing goods for their own families. Focusing solely on market exchange ignores the contributions of women, children, and neighbors. In Peterson's diaries, neighborhood exchange reinforced ties of religious kinship and helped in times of limited labor. Furthermore, the development of machinery for use in agriculture often required multiple workers. For example, threshing machines required several laborers to run the machines along with the livestock to pull the machines before the tractor. Threshing machines were prohibitively expensive to many farmers, and investments and cooperation were necessary when farmers used these new technologies.

Neighbor labor exchange was a necessity for many farm families as families could not provide all of the labor or capital investment necessary to harvest crops or raise animals. Given this, families worked together, and the strongest ties of community were based on families, religion, schools, and geographical proximity.⁴⁶ Peterson's diary

Memory and Reality: Family and Community in Rural Wisconsin, 1870-1970, (Madison: University of Wisconsin Press, 1992). Rachel Rosenfeld, *Farm Women: Work, Farm, and Family in the United States*, (Chapel Hill: University of North Carolina Press, 1985). Ruth Schwartz Cowan, *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave*, (Basic Books, 1983). Sally McMurry, *Transforming Rural Life: Dairying, Families and Agricultural Change, 1820-1885*, (Baltimore: John Hopkins University Press, 1995).

⁴⁵ Welker (2013), 410; Bushman (1998), 361.

⁴⁶ Billingsley (2004), 5.

spanned from the age of 36 to 79, a significant portion of his life course and the exchanging of labor that occurred while Peterson lived in Minnesota. With the diary entries being consistent, this primary source lends itself well to quantification which captures the vastness of the diary to answer questions such as how various forms of labor were organized and when.

While the letters discussed above provide insights into the exchange of labor in Minnesota, the family life cycle mechanisms and timing of exchange labor are still unclear. Given the detailed diary, studying the work organization of the Peterson farm provides a wonderful micro-history opportunity. The exquisite details of who, what, and where Andrew worked, including Elsa and several children, allows for a reconstruction of the work life course. With a vast literature on the contributions of women and children on family farms, what does it matter if we have one farmer to describe similar work-life patterns? I contend that the details of Peterson's diaries describe several factors that are not explored in the historical literature.⁴⁷

First, Peterson's diary described work beyond his farm systematically. The exchange of neighbor labor formed a fundamental aspect of the Midwestern family farm identity in the nineteenth and twentieth century, but it has been unclear whether the networks operated primarily for economic necessity or the maintenance of social ties.⁴⁸ As shown in California by Welker, this 19th century economy differed from the modern wage

⁴⁷ John Mack Faragher, "History from the Inside-Out: Writing the History of Women in Rural America," *American Quarterly*, 33:5, (1981). Welker, (2013).

⁴⁸ Sonya Salamon, Kathleen M. Gengenbacher, & Dwight J. Penas, "Family Factors Affecting the Intergenerational Succession to Farming," *Human Organization* 45:1 (1986), 24-25. Marian Deininger, & Douglas Marshall, "A Study of Land Ownership by Ethnic Groups from Frontier Times to the Present in a Marginal Farming Area in Minnesota," *Land Economics*, 31:4 (1955), 359-360. Stephen John Gross, "Handing Down the Farm: Values, Strategies, and Outcomes in Inheritance Practices Among Rural German Americans," *Journal of Family History*, 21:2 (1996), 193.

economy as it reflected a barter system within an emerging capitalist framework.

Second, a fundamental problem with historical statistics at the national level is the labor of underrepresented groups such as women and children were not well identified. This diary provides potential insights into why this occurs. While a diary from Elsa and/or the children would be preferred to measure their labor, Andrew's daily logs are the next best option. Finally, the diary of a male figure showed what Andrew thought important to record. As I pointed out earlier, some tasks were ignored, showing both the bias of Peterson's farm diary, but also why national occupational statistics ignore the contributions of underrepresented groups such as women and children.

Overall, the diary provides over 15,000 days of data. Currently, all of the available diary entries between June 1855 and December 1876 have been digitized and coded. This represents over half of the diary at 8,116 total days with approximately 5,742 work days.⁴⁹ I measure the labor contributions of different labor groups called Labor Task Equivalents (LTE). Conceptually, instead of the measure being based on *time*, it is based on *tasks*. I use this measure due to data limitations, but also to accurately describe the contributions of different groups of labor. For example, an entry describing male neighbors could include several people, meaning their contributions towards a task would be far greater than Andrew's own labor since Andrew only represented one person. While LTE is not a perfect measure, LTE represents the best measure available with the given data and the interpretation remains roughly the same as a labor productivity measure based on time. Figures 2-1 through 2-5 shows the LTE trends for the period of study (1855-1876). The

⁴⁹ For further information on how the diary was coded and how I developed the Labor Task Equivalent measure, please refer to Appendix A.

data is presented as a 12-month moving average of the LTE for different forms of labor for each month. For example, the high point of Andrew's Labor Task Equivalents was in 1860, where he averaged approximately 32 labor task equivalents each month. The data is separated into 6 different forms of labor: Andrew Peterson's labor, male neighbor labor, female neighbor labor, hired labor, female family labor, and male family labor. All of the measures are for work performed at Andrew Peterson's farm unless stated otherwise.

In his first years in Minnesota until he married in September 1858, Andrew Peterson spent most of his time working on his own farm. Figure 2-1 shows the distribution of work on Peterson's farm between himself and his male neighbors. His neighbors on average contributed approximately 4 working task equivalents prior to 1859. During this same period, Andrew on average provided 10 work task equivalents on other farms.

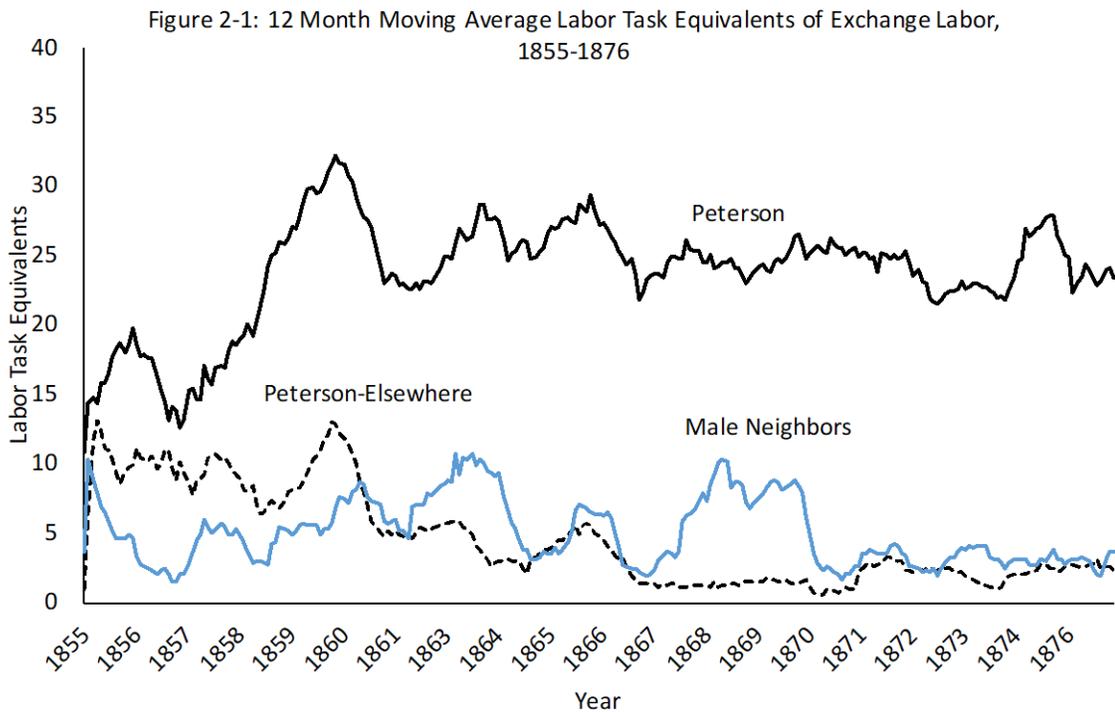
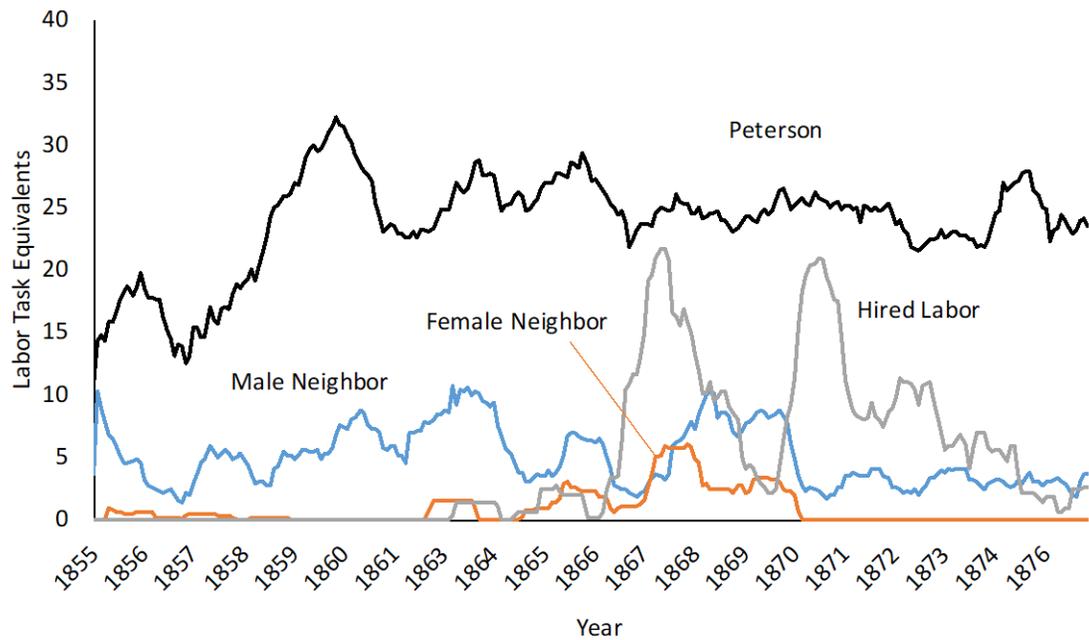


Figure 2-2: 12 Month Moving Average Labor Task Equivalents of Neighbor and Hired Labor, 1855-1876

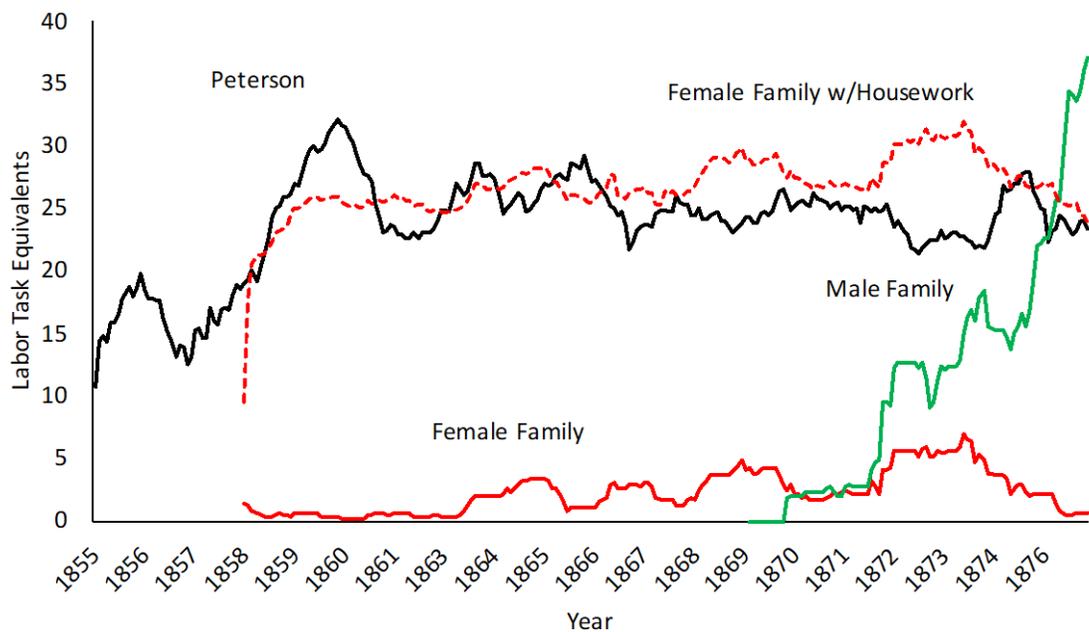


Starting in the year and a half prior to his marriage to Elsa in September 1858, Andrew spent significantly more time working on his own farm. Figure 2-2 shows Peterson’s work on the home farm averaged around 24 LTEs. Even with the decline of male neighbor labor in 1864 due to the Civil War, male neighbors averaged around 7 LTEs between 1858 and 1865. While Elsa recorded an average of 3 LTEs during this time period, she kept house as many women did during the time period (Figure 2-3), and Elsa performed some work that Peterson did not record. For example, Peterson recorded selling eggs and butter at the local market, yet never wrote about collecting eggs or making butter. It is certainly possible this labor was included in his vague “odds and ends” or “various tasks”, but more likely that Elsa (and later the young children) performed this task. To correct for this bias, I adjust the Female Family LTE, shown in Figure 2-3 as the Female Family w/Housework line. To adjust for Elsa’s housework, I simply added one LTE to every single

day for Elsa. The only times 1 LTE was not added were if Elsa was not present or if Elsa was sick. This is likely a conservative estimate, as I'm treating all housework as essentially one Labor Task Equivalent rather than separating cooking and washing as multiple tasks. Elsa's contributions often exceeds Andrew's even with this conservative assumption.

Women typically performed labor around the milking of cows and making of butter. Children eventually assisted with these tasks.⁵⁰ In one case, Andrew wrote how he helped Elsa with the shearing of sheep, rather than the typical "Elsa and I cocked hay". "Helping" Elsa implied that Elsa was responsible for the shearing of sheep, and Andrew helped whenever she needed assistance rather than the other way around. Furthermore, this showed that both Andrew and Elsa were involved with the wool production process, with Andrew focused more on the raising of sheep, and Elsa on the production of wool.

Figure 2-3: 12 Month Moving Average Labor Task Equivalents of Family Labor, 1855-1876



⁵⁰ McMurry (1995).

Figure 2-4: 12 Month Moving Average Labor Task Equivalents of Male Labor, 1855-1876

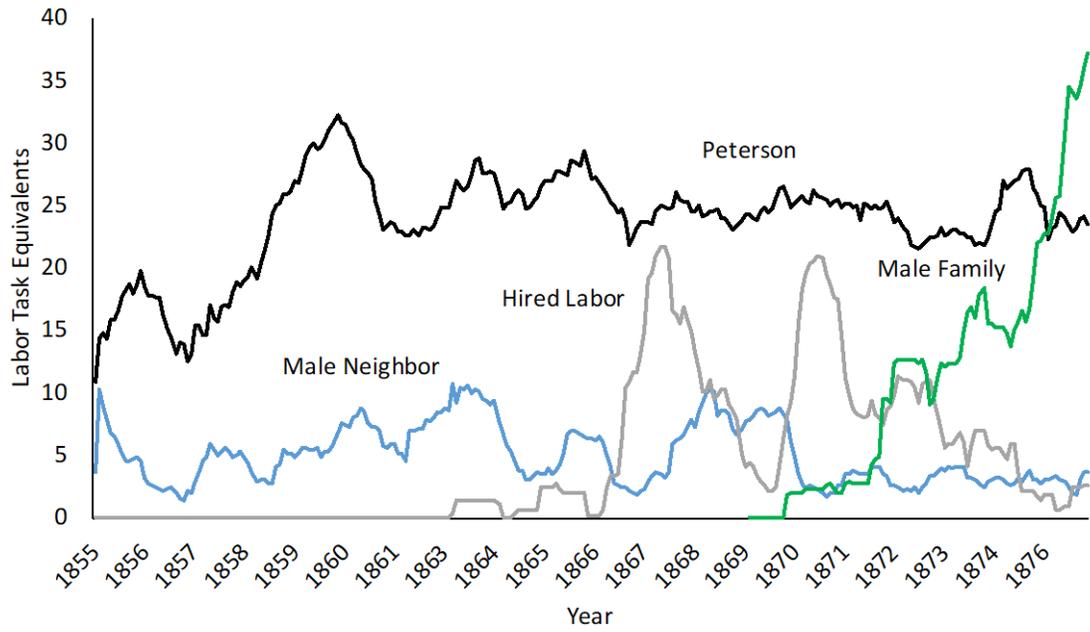
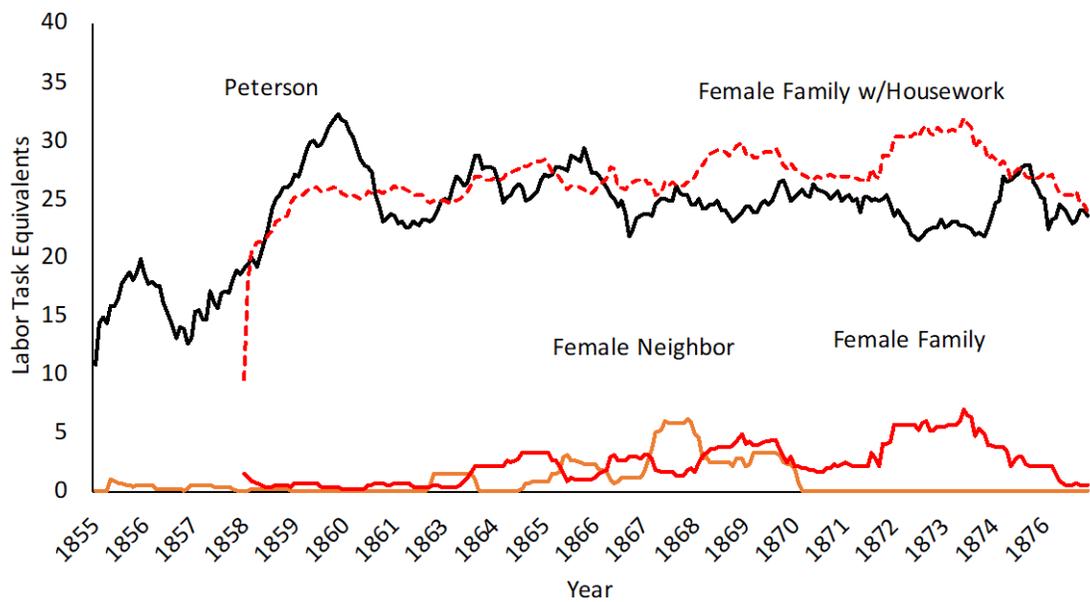


Figure 2-5: 12 Month Moving Average Labor Task Equivalents of Female Labor, 1855-1876



During this entire time period, female neighbor labor contributions were relatively

low. There would be short spurts of extensive contributions (including in late 1864 during the war drafts). I originally hypothesized that female neighbor labor contributions increased when Elsa was pregnant. Further analysis provides some evidence in support of this. During some pregnancy spells, female neighbors were present more often during the third trimester of Elsa's pregnancies. However, this did not occur during every pregnancy, and the fact that this labor contribution occurred primarily during the Civil War raises questions about the precise mechanism. Furthermore, some of the largest increases in female neighbor labor occurred during times when Elsa was not pregnant. Based on this, the results about pregnancy and female neighbor labor are inconclusive.

Male neighbor labor fluctuated during the early years of the Civil War, increasing from approximately 6 labor task equivalents to as high as 12 labor task equivalents. Male neighbor labor contributions declined dramatically in 1864 due to the Civil War drafts. While Peterson's contributions to other farms spiked during harvest in 1864, there was not a large increase on the average time spent at other farms by Andrew compared to previous harvests. Andrew spent 16 labor task equivalents on other farms in October 1864. Previously, he spent $15 \frac{2}{3}$ LTEs on other farms in August 1860, 16.5 LTEs in August 1861, and $15 \frac{1}{3}$ LTEs in August 1862.

In the late 1860s through early 1870s, hired labor increased dramatically (Figure 2-4). During this period, Andrew hired labor on a regular basis. Some of the hired labor assisted with tasks in the fields, but some of the work, such as a large spike in 1871 were associated with the construction of a new house. These cases can be defined as hired labor because Peterson's account book described directly paying them for their work or implied a boarder relationship where the laborer comes to stay with them, and later listed by

Peterson as “they left today.”⁵¹ Finally, Andrew distinguished them by stating clearly “Lars started work for me today.”⁵²

Andrew and Elsa’s daughter Ida turned 10 in August 1869. Andrew did not record much work from Ida in his diary, but their first son George “Sture” turned 10 in 1870. The male family labor excluding Andrew represented a dramatic transformation in the organization of labor on the Peterson farm. Beginning in 1872 the boys (Sture, Carl, Axel, later Frank) contributed 15 work task equivalents on average, the same as male neighbors and hired labor contributed in 1872 as seen in Figure 2-4. Elsa still contributed work in the fields at this time, suggesting that the Petersons had not yet substituted the boys’ labor for their mother entirely. Through the 1870s, Elsa’s labor declined while the boys increased dramatically, finally overtaking Andrew’s contributions in 1876. The boys’ work at other farms did not increase at the same rate as most of their work occurred on the home farm. At the same time, the contributions of male neighbors and hired labor declined dramatically. With the boys working, Peterson no longer required neighbor assistance. While some exchange of labor still occurred, it appears male neighbors provided relatively unimportant economic contributions other than the maintaining of social ties.

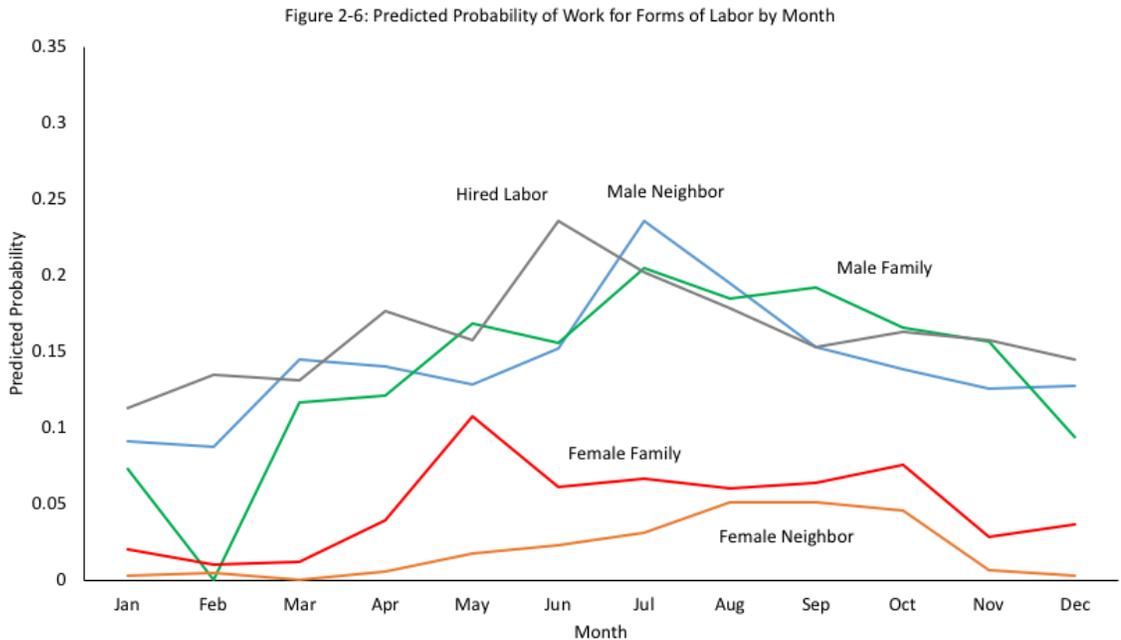
I use a logistic model to test under what circumstances different forms of labor were utilized, specifically testing for month and year. The dependent variable for each model was whether any labor from each form (Male Neighbor, Female Neighbor, Female Family, Male Family, Hired labor) were used by Peterson. The model indicates whether a form of labor was present for a specific task or not. The independent variables include

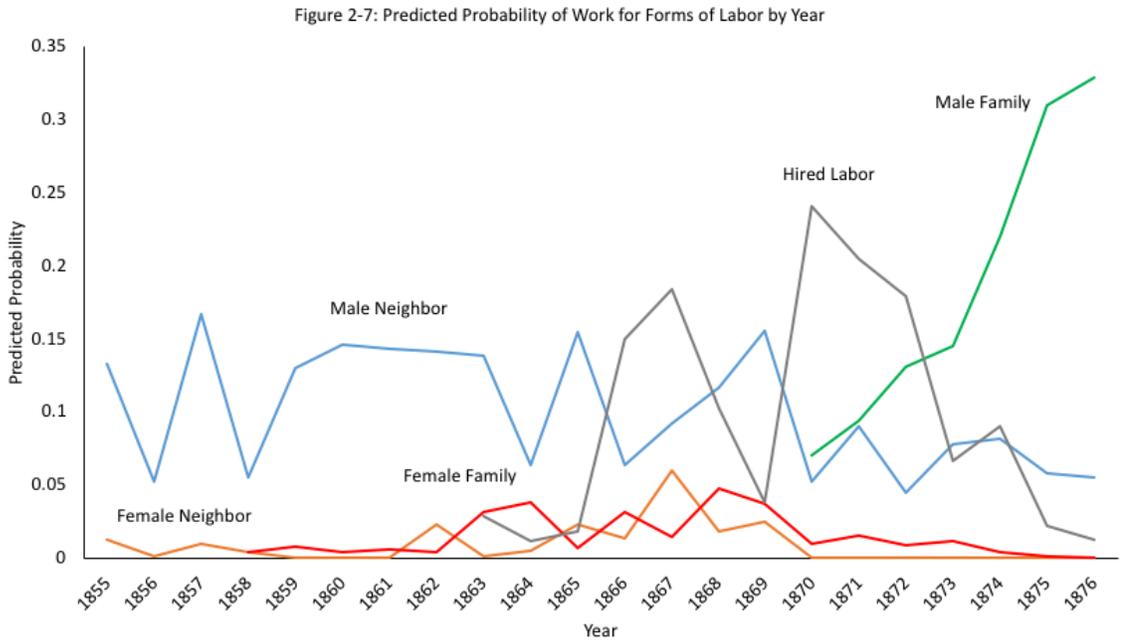
⁵¹ Peterson, and Ahlquist (tr.) (2007), 258.

⁵² Ibid, 240.

different types of tasks (grains, hay, farm improvements, livestock, miscellaneous, garden, horticulture, house construction) other forms of labor present, the month and year of work to control for seasonality and the family life cycle, and a variable controlling for whether Peterson was present at a farm other than his own in the previous week.

Predicted probabilities of the different groups of labor by month and year are presented in Figures 2-6 and 2-7. Most of the groups have higher predicted probabilities in specific months, indicating when those types of labor were most prevalent. Hired labor for instance had a predicted probability of 23.6% utilization in the month of June, Peterson used hired labor to build his house in the summer months with less agricultural work. Male neighbor labor and male family labor had predicted probabilities of 23.6% and 20.5% respectively in the month of July, the beginning of hay season. Female family labor's (mostly Elsa) highest predicted probability of recorded work occurred in May at 10.8%, associated with planting and shearing of sheep.





The predicted probabilities by year show similar trends as Figures 2-1 through 2-5. Male neighbor labor was the most prevalent form of labor, averaging around 12% predicted probability before 1865. Between 1865 and 1869, male neighbor labor and hired labor competed for the primary form of labor Peterson used. Starting in the early 1870s, hired labor was the predominant form of labor Peterson used, but his sons, between the ages of 12 and 16, quickly became the primary source of labor by 1873. By 1876, Andrew and Elsa’s sons predicted probability of working in 1876 was 32.9% compared to 7.1% in 1870.

I originally approached Andrew Peterson’s diary to better understand Elsa’s labor contributions towards the family farm. While Andrew captured some work by Elsa, he failed to discuss most of the housework Elsa completed. Assuming Elsa worked within the household every day excluding days she travelled or was sick, Figure 2-5 shows the work

performed by Elsa often meets or rivals the work Andrew performed.⁵³ It's likely some of the years may be an overestimate (e.g. Elsa worked in the fields while the daughters, who rarely appeared in Andrew's accounts, worked in the house) but ultimately, shows why the contributions of farm women were overlooked even in diaries from male farmers. Like any source, we must consider the viewpoint of the writer and their inherent biases and what interests them in their recordings of events. To Peterson, the running of the household held little interest, probably because he considered the household labor outside his domain. Given that Elsa could not write⁵⁴, we lose all of her insights and rely solely on Andrew's.

While we need to be careful with this micro-historical example as representative of farmer *mentalités* nationally, young farm families had fewer laborers, and with limited cash and capital, relied more on neighbor labor than family labor in the early family life cycle. Based on his account books, Andrew used neighbor labor to maintain the ethnic enclave and cheaply augment the small family labor force to maintain farm production in the early years of settlement. With these periods of neighborhood exchange during the early life cycle, historians need to look beyond the household when discussing the economic and demographic arrangements of family agriculture.

Furthermore, this particular case describes beneficial social networks to the Peterson family. We must be careful not to romanticize the economic and social benefits of the community on farm families. As shown by Bost, communities and social networks were not always inclusive, whether that is based on gender, religion, ethnicity, race, past

⁵³ I assume one "housework" day as one task equivalent. This still likely underreports Elsa and the children's contributions.

⁵⁴ We know this from both Census Enumeration and that the "last letter written home" after Andrew's death was written in Swedish by a neighbor, not Elsa. Mihelich (1984), 140.

misdeeds or time of arrival to the area. Secondly, a community does not imply tranquility or a harmonious place of interaction but is the site of power struggle and negotiations by many different parties. This inevitably led to conflict and hurt rather than helped some individuals and families. Finally, the perspective of these social networks in this paper has primarily come from male farmers. Neglecting the observations of women and children mean that the full social network colored by the views of the white male patriarchal figure is not representative of all individuals within the family or the community. Reading into silent populations is fundamental to narrating the story of neighborhood exchange and labor as women and children also employed social networks.

Chapter 3: “The Return Should be ‘None’”: Occupational Responses for Farm Women and Children in the Census, 1850-1940

In the “Report of the Country Life Commission” in 1909, L.H. Bailey and Commission wrote, “The most difficult rural labor problem is that of securing household help on the average farm. The larger the farm the more serious the problem becomes. The necessity of giving a suitable education to her children deprives the farm woman largely of home help.”¹ With compulsory education, migration, declining fertility, cheap wage labor and industrialization of agricultural processes, farmers relied less on family labor as the primary work force for farm operations. This transition took several generations, yet many people, both farmers and urbanites, romanticize farmers as the “independent” man who relied not on the wage of capitalist employers, but on the sweat of his brow with “dependent” women and children barely being mentioned.²

The yeoman farmer narrative of Jeffersonian idealism and Turner’s Frontier Thesis however is largely misplaced. Instead of the independent male farmer, historiography places women and children at the forefront of family economic production.³ Yet, agricultural statistics on the distribution of farm workers do not reflect this economic

¹ L.H. Bailey, et al, *Report of the Country Life Commission*, (Washington D.C.: Government Printing Office, 1909), 43.

² Thomas Jefferson, *Notes on the State of Virginia*, 3rd Ed. (1781), 290-291. Paul Conklin, *A Revolution Down on the Farm: The Transformation of American Agriculture since 1929*, (Lexington: University Press of Kentucky, 2008), 4, 33. Lee J. Alston, & Joseph P. Ferrie, “Time on the Ladder: Career Mobility in Agriculture, 1890-1938,” *The Journal of Economic History*, 65:4, (2005), 1077-1078. Wayne D. Rasmussen, & B.F. Stanton, “The Structure of Agriculture in an Historical Context,” in *Size, Structure, and the Changing Face of American Agriculture*. ed. Arne Hallam, (Boulder: Westview Press, 1993), 33-36. Frederick Jackson Turner, “The Significance of the Frontier in American History,” *Report of the American Historical Association for 1893* (Washington D.C: Government Printing Office, 1894), 201.

³ Jeanne Boydston, *Home and Work: Housework, Wages, and the Ideology of Labor in the Early Republic*, (New York: Oxford University Press, 1990), x, xiv-xvii. Mary Neth, *Preserving the Family Farm: Women, Community, and the Foundations of Agribusiness in the Midwest, 1900-1940*, (Baltimore: John Hopkins University Press, 1995), 2-3, 214-216. John Mack Faragher, “History from the Inside-Out: Writing the History of Women in Rural America,” *American Quarterly*, 33:5 (1981), 545, 551. Nancy Grey Osterud, *Bonds of Community: The Lives of Farm Women in Nineteenth-Century New York*, (Ithaca: Cornell University Press, 1991). Jane Marie Pederson, *Between Memory and Reality: Family and Community in Rural Wisconsin, 1870-1970*, (Madison: University of Wisconsin Press, 1992). Rachel Rosenfeld, *Farm Women: Work, Farm, and Family in the United States*. (Chapel Hill: University of North Carolina Press, 1985).

system, particularly for women. On the contrary, the United States Census returns reinforced the Jeffersonian vision of the yeoman farmer with the wife “Keeping House” while children were “At Home.” The diverging narratives reflect different sources such as personal diaries, account books, and oral histories versus the statistical, nation-state project of the United States Census. This chapter aims to describe how the Census collected occupation, what the Census statistics say about farm occupations for women and children and explore why some women and children reported an occupation and others did not. Previous historiography establishes the importance of gender norms⁴, census biases⁵, child labor laws⁶, compulsory education⁷, and socio-demographic traits⁸ to explain the lack of occupational reporting for women and children.

While my results substantiate these claims, I also focus on biases in the Census such as the month of enumeration, the sex of the household respondent, and enumerator bias. While the month of enumeration and sex of the household respondent were relatively minor biases compared to larger gender biases and socioeconomic determinants, enumerator bias played a larger role, specifically for children. School attendance and educational attainment, parental occupation status (specifically mother’s status), age and

⁴ Robert Smuts, “The Female Labor Force: A Case Study in the Interpretation of Historical Statistics,” *Journal of the American Statistical Association*, 55:289 (1960), 73. Nancy Folbre, “Women’s Informal Market Work in Massachusetts, 1875-1920,” *Social Science History*, 17:1 (1993), 137. Nancy Folbre, “The Unproductive Housewife: Her Evolution in Nineteenth-Century Economic Thought,” *Signs*, 16:3 (1991), 464-465. Margo Anderson, “The History of Women and the History of Statistics,” *Journal of Women’s History*, 4:1 (1992), 23-24.

⁵ Nancy Folbre, & Marjorie Abel. “Women’s Work and Women’s Households: Gender Bias in the U.S. Census,” *Social Research*, 56:3 (1989), 545-546. Margo Anderson Conk, “Occupational Classification in the United States: 1870-1940,” *The Journal of Interdisciplinary History*, 9:1 (1978), 118-119.

⁶ Carolyn Moehling, “State Child Labor Laws and the Decline of Child Labor,” *Explorations in Economic History*, 36 (1999), 74.

⁷ Carolyn Moehling, “Family Structure, School Attendance, and Child Labor in the American South in 1900 and 1910,” *Explorations in Economic History*, 41 (2004), 95.

⁸ Claudia Goldin, “Household and Market Production of Families in a Late Nineteenth Century American City,” *Explorations in Economic History*, 16 (1979), 111. Christine Bose, “Household Resources and U.S. Women’s Work: Factors Affecting Gainful Employment at the Turn of the Century,” *American Sociological Review*, 49:4 (1984), 488. Carolyn Moehling, “Women’s Work and Men’s Unemployment,” *The Journal of Economic History*, 61:4 (2001), 947-948.

sibling order, enumerator bias, gender bias, and changing enumerator instructions primarily explain why some women and children returned an occupation and others did not.

DEVALUATION OF HOUSEHOLD WORK

Occupational reporting in the Census was affected by the transition from corporate family economies to male breadwinner households and its ideological dominance in the United States through World War II. The feminist argument for the rise of the breadwinner-homemaker households revolves around the devaluation of household work over time. Increasing wage labor opportunities literally devalued household labor as household labor did not produce an income. This reinforced patriarchal authority where men became the primary wage laborers while women focused on household work and social reproduction of the family. While women still labored in temporary work, seasonal work, or provided additional support during times of need, the generalization by sources such as the Census was that most women were not gainfully employed wage laborers in the late nineteenth- and early twentieth-century.⁹

The male-breadwinner household redistributed labor to maximize household consumption patterns. With the rise of new consumption clusters since the mid-seventeenth-century, male breadwinner households moved towards specialization, which allowed families to maximize production returns. As the life cycle progressed, children were incorporated into the labor structure of the household as necessary.¹⁰ While males

⁹ Boydston (1990), xviii-xix. Joan M. Jensen, *Loosening the Bonds: Mid-Atlantic Farm Women, 1750-1850*, (New Haven: Yale University Press, 1986), 33-35. Nancy Folbre, & Barnet Wagman, "Counting Housework: New Estimates of Real Product in the United States, 1800-1860," *The Journal of Economic History*, 53:22 (1993), 277-278.

¹⁰ Jan De Vries. *The Industrious Revolution: Consumer Behavior and the Household Economy, 1650 to the Present* (Cambridge: Cambridge University Press, 2008), 210-214. Naomi R. Lamoreaux, "Rethinking the Transition to Capitalism in the Early American Northeast," *The Journal of American History*, 90:2 (2003), 438, 449-450; Richard

earned the primary wages for the family, women earned money through seasonal work and household production of goods. Furthermore, the expansion of industrialized labor provided opportunities for families to adopt the male breadwinner model to become the predominant family economy form in the United States around the turn of the 20th century until the rise of the dual earner economy starting in the 1950s.¹¹

The redistribution of labor within families was highly dressed in the language and ideology of gendered spheres. The "natural states" of independent men and dependent women were used as ideological justification for why men and women belonged in a specific sphere of influence. Household tasks appeared less valuable, and when combined with the ideology of the independent head of household, households maximized household productivity by having men work in the marketplace and women work in the household.¹² While these "spheres" were not independent nor mutually exclusive of one another, many families framed their work on the male-breadwinner model. Most households were unable to attain this ideal and required some form of market work by both spouses.¹³ These studies largely focus on urban areas, but on rural farms, these blurred lines of house and market work were further complicated when spouses and children worked in the field and within the household.¹⁴

Lyman Bushman, "Markets and Composite Farms in Early America," *The William and Mary Quarterly*, 55:3 (1998), 361, 364-365, 368, 371-372.

¹¹ Steven Ruggles, "Patriarchy, Power, and Pay: The Transformation of American Families 1800-2015," *Demography*, 52 (2015), 1801-1805

¹² Boydston (1990), 18.

¹³ De Vries (2008), 200-202.

¹⁴ Kerry J. Daly, "Deconstructing Family Time: From Ideology to Lived Experience," *Journal of Marriage and Family*, 63:2, (2001), 284-285.

National land expansion and technological advances shifted women's role in agriculture.¹⁵ In a von Thünenian system, previous grain farming became more profitable on distant frontiers in the West, causing farms in the Northeast to shift to other forms of agriculture and household manufactures such as textiles, eggs, butter, and dairy.¹⁶ Transitions in production did not lead to clear distinctions in work by gender at first. In the case of butter, men fed and tended cows and women milked the cows and churned butter. As butter production became highly commoditized, men began to oversee other parts of the production process usually governed by women. As the nineteenth-century continued, cooperative creameries emerged, which moved the location of butter making from the household to the factory.¹⁷ Likewise, the rise of new technologies such as the scythe, far heavier and more burdensome than the sickle, slowly pushed women out of the work of haying. Women helped with harvesting and planting, but the adoption of threshers and steel plows pushed women away from these tasks and towards household duties.¹⁸

Industrialization of household technologies redistributed work within the household. The Country Life Commission and time-use studies from the 1920s argued in favor of new technologies such as the stove and sewing machine via agricultural extension and home economics training, which greatly reduced the amount of work related to those

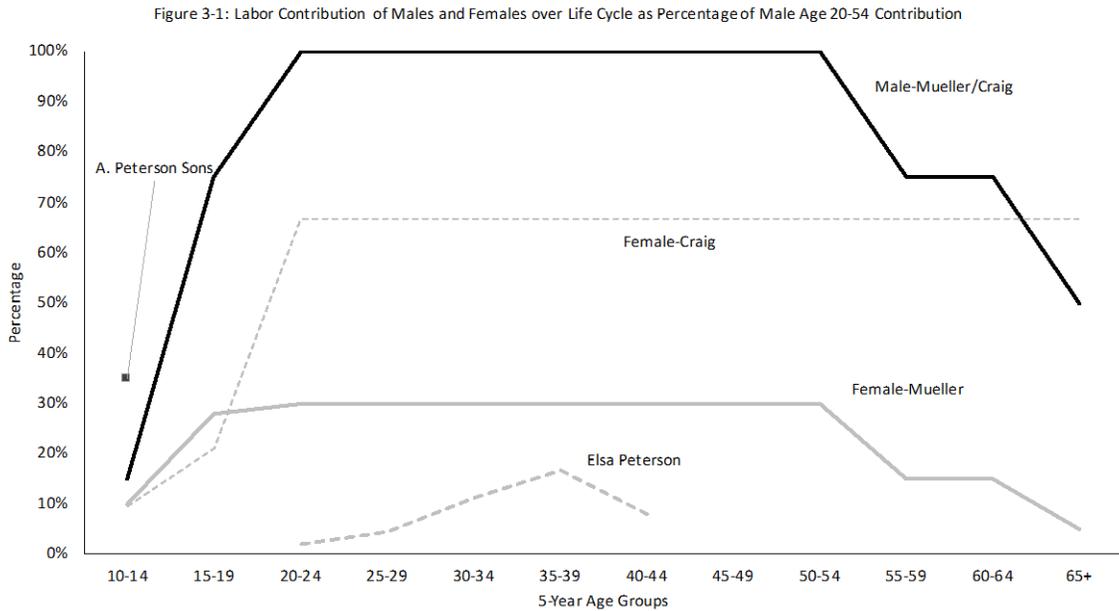
¹⁵ Christopher Clark, "The Agrarian Context," in *Capitalism Takes Command: The Social Transformation of Nineteenth-Century America*. Ed. Michael Zakim, & Gary J. Kornblith, (Chicago: University of Chicago Press, 2012), 28-29.

¹⁶ Steven Stoll, *Larding the Lean Earth: Soil and Society in Nineteenth-Century America*, (New York: Hill and Wang, 2003). Lee Craig, *To Sow One Acre More: Childbearing and Farm Productivity in the Antebellum North*, (Baltimore: John Hopkins University Press, 1993), 70-72.

¹⁷ Bailey (1909), 38-42. Sally McMurry, *Transforming Rural Life: Dairying, Families and Agricultural Change, 1820-1885*, (Baltimore: John Hopkins University Press, 1995), 9.

¹⁸ Jensen (1986), 54-56. Steven R. Hoffbeck, *The Haymakers: A Chronicle of Five Farm Families*, (Minneapolis: Minnesota Historical Society, 2000), 23. Ed. Lucy Leavenworth Wilder Morris, *Old Rail Fence Corners: Frontier Tales Told by Minnesota Pioneers*, (St. Paul: Minnesota Historical Society Press, 1976).

particular tasks. However, industrialization led to a substitution towards other household labor rather than leisure.¹⁹



Historically, children acted as a substitute for women's agricultural labor. Through the family life cycle, a woman's role in farm labor rose until the first children reached 10. During this period, children trained in household and farm chores. While the tasks were often designated by gender, the distribution and birth order of sons and daughters more often determined who worked where than separate gender spheres.²⁰ Once children fully worked in the house and fields (aside from schooling), women slowly withdrew their labor from the family work force in agriculture. Women focused on "home manufacturing" and

¹⁹ Ruth Schwartz Cowan, *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave*, (New York: Basic Books, 1983), 2-6. Bailey (1909), 42-44. G.E. Wasson, *The Use of Time by South Dakota Farm Homemakers*, South Dakota State College of Agriculture and Mechanic Arts, Agricultural Experiment Station, (1930), 6-8. Maud Wilson, *Use of Time by Oregon Farm Homemakers*, Oregon State Agricultural College, Agricultural Experiment Station, (1929), 9.

²⁰ Pamela Riney-Kehrberg. *Childhood on the Farm: Work, Play and Coming of Age in the Midwest*, (Lawrence: University of Kansas Press, 2005), 4-6.

other household related-labor, but their work in the fields during planting and harvest were cut back unless necessity deemed otherwise. Figure 3-1 shows a hypothetical generalized life cycle of working contributions graphically for men and women.²¹ The Figure shows an approximate percentage of labor force work by gender over the life cycle as a percentage of an adult male laborer. For example, a 10-14 year old boy had approximately 15% of the labor force participation as an adult male laborer. I include an estimate of the contributions of Andrew Peterson's sons and his wife Elsa from Chapter 2 to situate the Peterson diary within the hypothetical values. Younger children and women contributed less towards market work than males, but still contributed some labor individually. As a group, they contributed more than a male breadwinner as seen by Andrew Peterson's family in the mid-1870s. Andrew recorded his children's contributions higher than the hypothetical generalization while Elsa's contributions were lower. The shortcoming of this figure and Andrew's diary is neither consider fundamental household work the family farm required to operate.²²

Table 3-1 applies these hypothetical values to Andrew Peterson's family in 1880. The "Work Contribution-Farm Occ Only" column records the hypothetical values only if the individual was gainfully employed. If only cases where an individual reported a farm

²¹ The hypothetical values for the figure come from Eva Mueller, "The Economic Value of Children in Peasant Agriculture," in *Population and Development*, ed. R. Ridker. (Baltimore: John Hopkins Press, 1976) 101, 118. Other sources that corroborate this generalization are Alexander V. Chayanov (1925), *The Theory of Peasant Economy* ed. Daniel Thorner, Basile Kerblay, R.E.F. Smith (Homewood, IL: American Economic Association 1966), 59. Lutz K. Berkner, "The Stem Family and the Developmental Cycle of the Peasant Household: An Eighteenth-Century Austrian Example," *The American Historical Review*, 77:2 (1972), 414-417. De Vries, (2008), 200. The "Female-Craig" line show the economic contributions from 1860 women in the northern United States, which are significantly higher than the Mueller's estimates. Lee Craig, *To Sow One Acre More: Childbearing and Farm Productivity in the Antebellum North*, (Baltimore: John Hopkins University Press, 1993), 80. The Elsa Peterson and A. Peterson Sons contributions comes from the digitized and coded Peterson diaries, data available upon request. Matt Nelson, *Andrew Peterson and Family Coded Account Book 1855-1876*.

²² De Vries (2008), 200.

occupation were given this hypothetical value, the total Peterson family contribution to agriculture would be equal to 0.8, or 80% of an adult male laborer. However, if all individuals regardless of occupation were assigned their hypothetical life course contribution (shown in the column “Work-Contribution-All”), the family contribution equals 3.9, or almost 4 adult male laborers. When these hypothetical values are applied to all farm families in 1880, we find that the average contributions of other family farm workers only exceeded adult male head of households in their elderly years for those with gainful employment (Figure 3-2, Other-Contributions-Farm). Using all individuals (regardless of occupational status), the contributions of women, children and other laborers in the household on average exceeded that of the male head of household by age 40 (Other-Contributions-All).

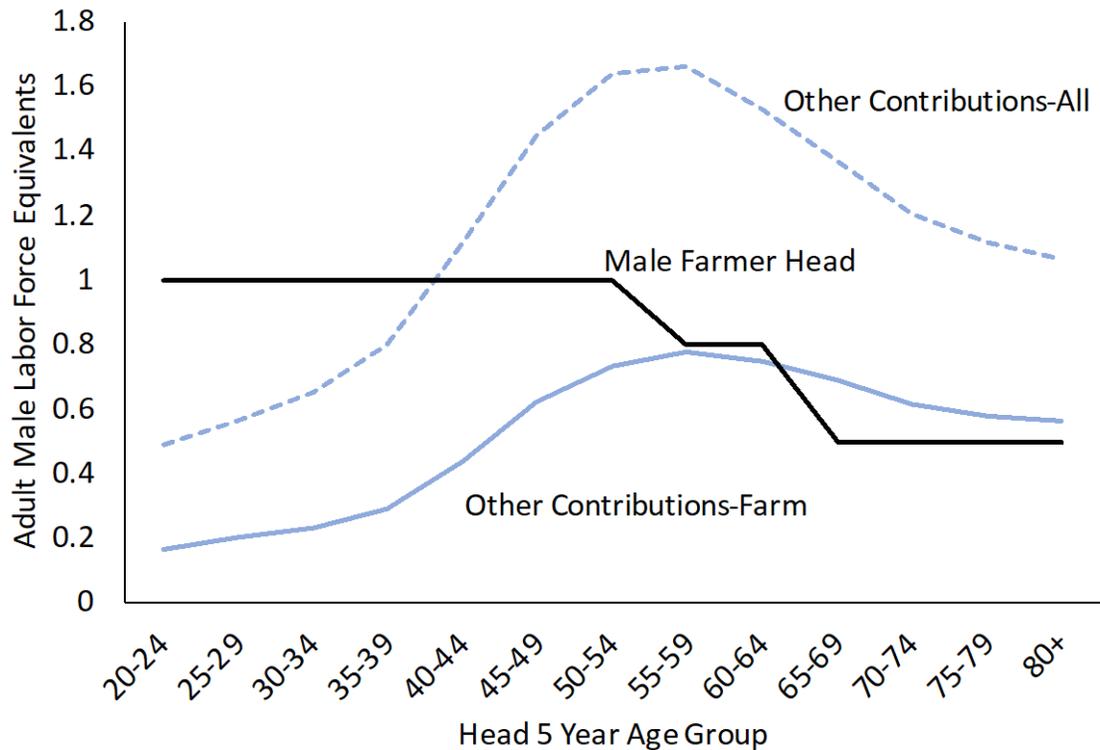
Table 3-1: Hypothetical Farm Contributions of Andrew Peterson Family, 1880

First Name	Last Name	Age	Sex	Occupation	Work-Contribution- Farm Occ Only	Work-Contribution- All
ANDREW	PETERSON	61	MALE	FARMER	0.8	0.8
ELSA	PETERSON	44	FEMALE	KEEPING HOUSE	0	0.3
IDA	PETERSON	20	FEMALE	AT HOME	0	0.3
GEORGE	PETERSON	19	MALE	AT HOME	0	0.75
JOHN	PETERSON	17	MALE	AT HOME	0	0.75
CHARLES	PETERSON	15	MALE	AT HOME	0	0.75
FRANK	PETERSON	12	MALE	AT SCHOOL	0	0.15
ANNA	PETERSON	10	FEMALE	AT SCHOOL	0	0.1
JOSEPHINE	PETERSON	8	FEMALE		0	0
EMMA	PETERSON	4	FEMALE		0	0
OSCAR	PETERSON	1	MALE		0	0
Total Family Contribution					0.8	3.9

Notes: Hypothetical labor force values come from Eva Mueller, "The Economic value of Children in Peasant Agriculture"

Source: Ruggles et al. *Integrated Public Use Microdata Series: Version 6.0.*

Figure 3-2: Work Contributions from Family Members with and without Farm Occupation, 1880



FARM OCCUPATIONAL DEFINITIONS 1850-1940

The United States Census collected detailed occupational information for individuals in the Population schedules starting in 1850.²³ Issues of enumeration universes, the ambiguity of "gainful employment", and restrictions on what constituted labor complicate the measurement and harmonization of farm labor using Census sources.²⁴ With lower age limits, the labor of children were unreported for many years (Table 3-2). In 1850, only men were asked the occupation question, making it impossible to measure women's farm labor. Additionally, 1850 and 1860 was limited to the free population, which

²³ While occupational information regarding industry had been collected in 1820 and 1840, because the census enumerated "households" rather than "individuals" before 1850, a particular individual's occupation cannot be identified.

²⁴ Evan Roberts, et al., "Occupational Classification in the North Atlantic Population Project," *Historical Methods*, 36:2 (2003), 91.

means slaves were completely ignored in official statistics. IPUMS will soon be releasing complete count 1850 slave data linked to the free population data.

The Census collected occupation information that deliberately underreported the contributions of children and especially women because of their concern with counting household work as gainful employment. The exaltation of domestic virtues, patriarchal interests, growing class inequalities, and Anglo-American political-economic theory all devalued the work of women in the home. Specifically, the separation of moral/private spheres from economic/public spheres combined with a changing focus from productive/non-productive to market/non-market literally created an illusion that women and children were non-productive.²⁵ Further, the Census altered its gainful occupation definition over the years to better capture wage labor.²⁶ This framework did not apply to the agricultural sector, which heavily relied on the corporate family economy model rather than a male breadwinner model.²⁷

Table 3-2: U.S. Census Universe for Occupation by Year, 1850-1950

Year	Universe
1850	Free Males Age 15+
1860	Free Persons Age 15+
1870	All Persons
1880-1890	Persons Age 10+ and others with a regular occupation
1900	Persons Age 10+ who worked or looked for work during previous twelve months, and non-working "capitalists."
1910-1930	All Persons
1940-1950	Persons Age 14+ and in the labor force; not institutional inmates; not new workers

Source: IPUMS-USA, https://usa.ipums.org/usa-action/variables/OCC1950#universe_section

Questions of Industry were first asked in the 1820 and 1840 Population Censuses.

While Agriculture was one of the industries inquired, because the census was conducted

²⁵ Folbre (1991), 467, 469.

²⁶ Anderson-Conk (1978), 121, 123, 126.

²⁷ Ruggles (2015), 1800-1801.

for households rather than individual, researchers cannot precisely measure which people labored in agriculture. Starting in 1850 the Census asked occupational questions of free men rather than households and defined farmers as "The proprietor of a farm for the time being, who pursues agriculture professional or practically, is to be recorded as a farmer; the men who are employed for wages by him are to be termed farm laborers."²⁸ By distinguishing between "professional or practical" farmers, the Census recognized both subsistence-oriented agriculture as well as market-orientated farming. Farm laborers were defined as those who worked for wages. Theoretically, this excluded any family laborers who did not work for wages, though children who worked for the family may have still received the farm laborer occupation. In 1860, the question was extended to free women.

Starting in 1870 and continuing through 1890, the Census collected information on women working within households for no wages. Spouses keeping house for their families with no other occupation were recorded as "Keeping House." Alternatively, women "who receive a stated wage or salary for their services" of household caretaking were termed "Housekeepers."²⁹ Daughters fulfilling the "Keeping House" duties were reported with no occupation in 1870 and 1880. In 1890, this rule changed to "Housework-without pay." Similarly, the Census measured gainful employment for children with the following instruction;

The inquiry as to Occupation will not be asked in respect to infants or children too young to take any part in production. Neither will the doing of domestic errands or family chores out of school be considered an occupation. "At home" or "Attending School" will be the best entry in the

²⁸ *1850 Census: Instructions to Enumerators*. Minnesota Population Center. Accessed 11/1/2013. <https://usa.ipums.org/usa/voliii/inst1850.shtml>

²⁹ Census Office: Department of the Interior, *Instructions to Assistant Marshalls, Ninth Census*, (Washington, D.C.: Government Printing Office, 1870), 14. *1880 Census: Instructions to Enumerators*, Minnesota Population Center, Accessed 11/1/2013, <https://usa.ipums.org/usa/voliii/inst1880.shtml>. Census Office: Department of the Interior, *Instructions to Enumerators, Eleventh Census*, (Washington, D.C.: Government Printing Office, 1890), 28.

majority of cases. But if a boy or girl, whatever the age, is earning money regularly by labor, contributing to the family support, or appreciably assisting in mechanical or agricultural industry, the occupation should be stated.³⁰

While the vague definition of "appreciably assisting" clearly indicated the unreliability of measuring unpaid family labor and children who commonly worked for family establishments and attended school simultaneously, it seems appropriate to assume that many children recorded as "At Home" or "Attending School" labored on the farm or within the household in some capacity.³¹ In 1900, the Census Bureau specified that older children who worked on the farm should be returned as farm laborers. If the father and son(s) jointly operated the farm for fixed shares of the product, then the sons should be returned as farmers. The Census discontinued collecting "Keeping House" as a non-occupational response in 1900 but expanded the "At School" categorization for children.³²

Capturing wage farm laborers was difficult because of the mobility of the Americans at the time.³³ The mobility of the American work force forced many workers to roam from job to job. Hoboes took jobs such as lumbering, factory jobs, cutting ice during the winter, and harvesting jobs during the fall. These workers were not always captured as farm laborers because the enumeration months were often in the spring or winter when

³⁰ Census Office: Department of the Interior, *Instructions to Assistant Marshalls, Ninth Census*, (Washington, D.C.: Government Printing Office, 1870), 14-15.

³¹ While there is evidence of children under the age of 10 helping out with farm chores, it seems more likely that this work was being supervised and was more "on the job training" than actual work performed. The work contribution of children being less than what they consume led to a net cost for the family. Riney-Kehrberg (2005), 4-6. Craig (1993), 80.

³² Census Office: Department of the Interior, *Instructions to Enumerators, Twelfth Census*, (Washington, D.C.: Government Printing Office, 1900), 38.

³³ Patricia Kelly Hall, & Steven Ruggles, "Restless in the Midst of their Prosperity: New Evidence of the Internal Migration Patterns of Americans, 1850-1990," *Journal of American History*, 91: (2004), 844.

demand for farm labor was lower. More likely, they appeared in other employment or as non-classified laborers.³⁴

Due to the blurred lines of housework and farm work, there was room for interpretation of what constituted farm work. The 1910 Enumerator Instructions stated

A woman working regularly at outdoor farm work, even though she works on the home farm for her husband, son, or other relative and does not receive money wages, should be returned in column 18 as a *farm laborer*. Distinguish, however, such women who work on the home farm from those who work away from home, by writing in column 19 either *home farm* or *working out*, as the case may require.³⁵

Approximately 19% of white female spouses and 22% of black female spouses were recorded as paid farm laborers in 1910.³⁶ The Census Bureau likely considered this an overestimate and further restricted the definition of farm work in 1920, stating

For a woman who works *only occasionally*, or *only a short time each day* at outdoor farm or garden work, or in the dairy, or in caring for livestock or poultry, the return should be *none*; but for a woman who works *regularly* and *most of the time* at such work, the return should be *farm laborer-home farm*; *farm laborer-working out*; *laborer-garden*; *laborer-dairy farm*; *laborer-stock farm*; or *laborer-poultry yard* as the case may be.³⁷

While the Census maintained the definition for regularly working it emphasized identifying women and children who did not do enough work rather than those who did.

Census officials felt too many women and children were considered laborers in some

³⁴ Frank Tobias Higbie, *Indispensable Outcasts: Hobo Workers and Community in the American Midwest, 1880-1930*, (Urbana: University of Illinois Press, 2003), 100-105. Anderson-Conk (1978), 124, 127-128, 130.

³⁵ Census Office: Department of the Interior, *Instructions to Enumerators, Thirteenth Census*, (Washington, D.C.: Government Printing Office, 1910), 34.

³⁶ Matthew Sobek, "A Century of Work: Gender, Labor Force Participation, and Occupational Attainment in the United States, 1880-1990," (Dissertation, University of Minnesota, 1997): 35.

³⁷ Census Office: Department of the Interior, *Instructions to Enumerators, Fourteenth Census*, (Washington, D.C.: Government Printing Office, 1920), 34.

capacity when the officials believed they should not be. In a 1929 Census monograph, Joseph Hill more or less confirmed these suspicions on the changing definitions. Hill wrote

In 1910 the emphasis was upon *returning* as a farm laborer every woman working regularly at outdoor farm work; in 1920 the emphasis was upon *not returning* as a farm laborer any woman who worked at outdoor work only occasionally or only a short time each day, thus indicating in the one case an apprehension that the enumerator might fail to return as a farm laborer some woman who ought to be so returned and in the other case that he might return as a farm laborers one woman who ought not to be so returned. This change of emphasis came about because a study of the occupation returns convinced those who had charge of the tabulation in 1910 that many women had been returned as farm laborers who could not be properly regarded as such-that there was, in short, an over enumeration of women farm laborers.³⁸

The Census usually conducted enumeration in the spring or early summer between April and June. For the 1920 Census however, the Bureau collected information starting in January. Because of the seasonality of agricultural work, this introduced a clear bias towards non-work. Hill, and Alba Edwards, an Expert Special Agent at the Census Bureau,

³⁸ Joseph A. Hill, *Women in Gainful Occupations 1870-1920: A Study of the Trend of Recent Changes in the Numbers, Occupational Distribution, and Family Relationship of Women Reported in the Census as Following a Gainful Occupation*. (Washington DC: Department of Commerce, Bureau of the Census, 1929), 17.

Figure 3-3: Months of Census Enumeration 1850-1870

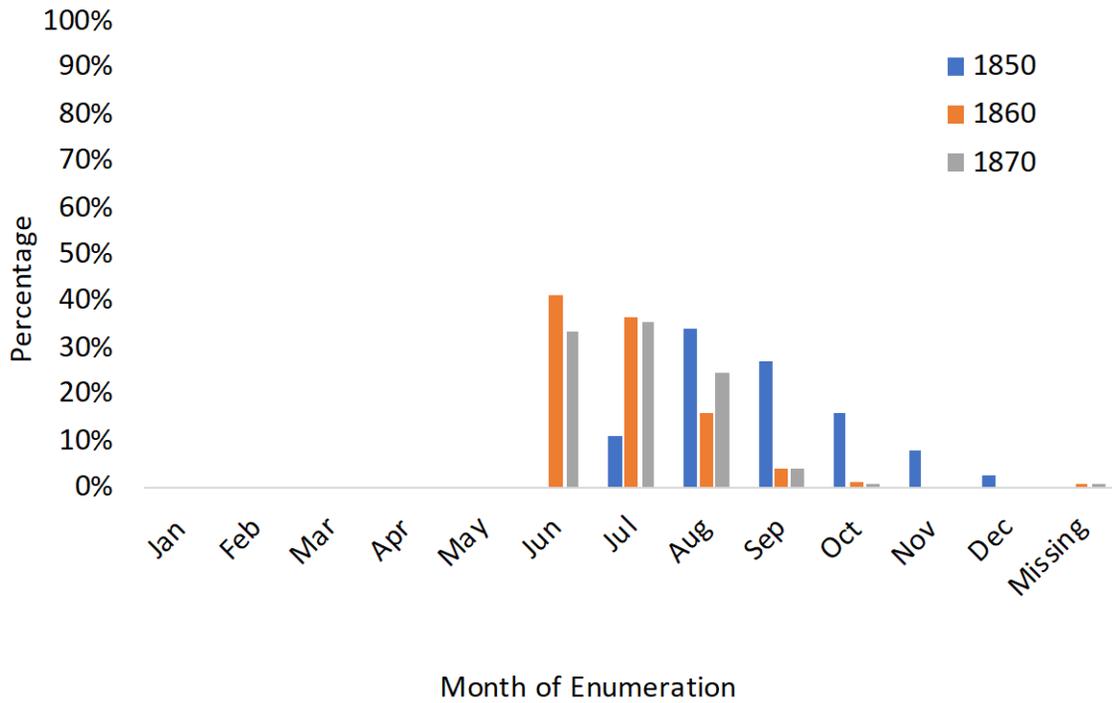


Figure 3-4: Months of Census Enumeration 1880-1900

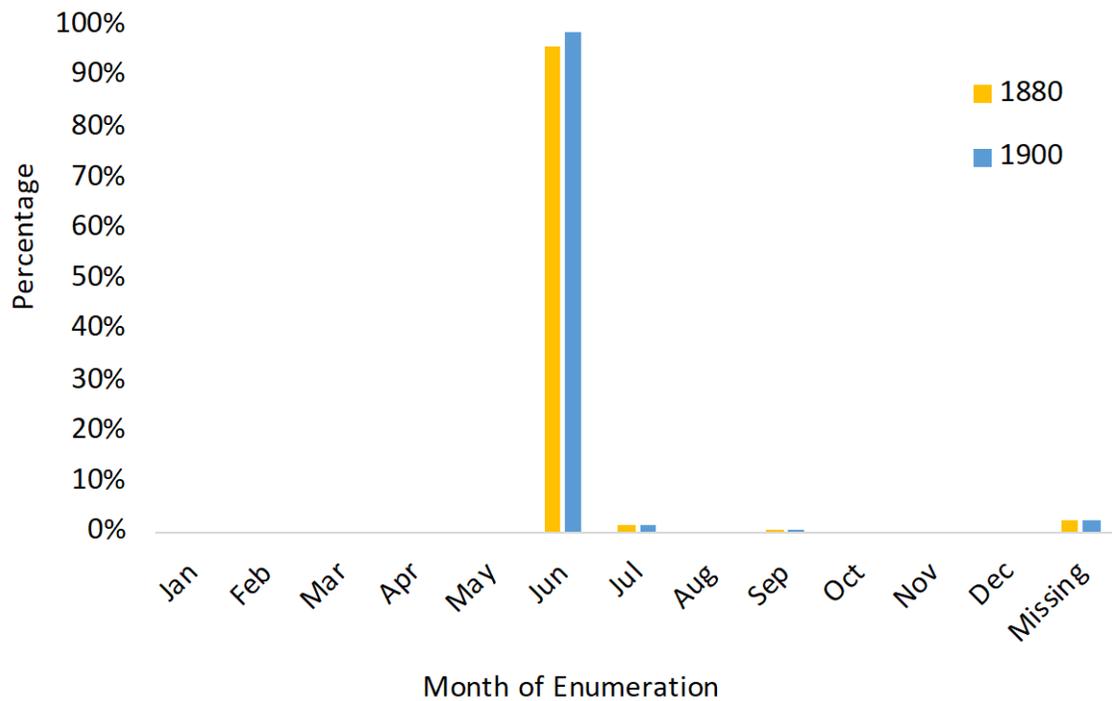


Figure 3-5: Months of Census Enumeration 1910-1930

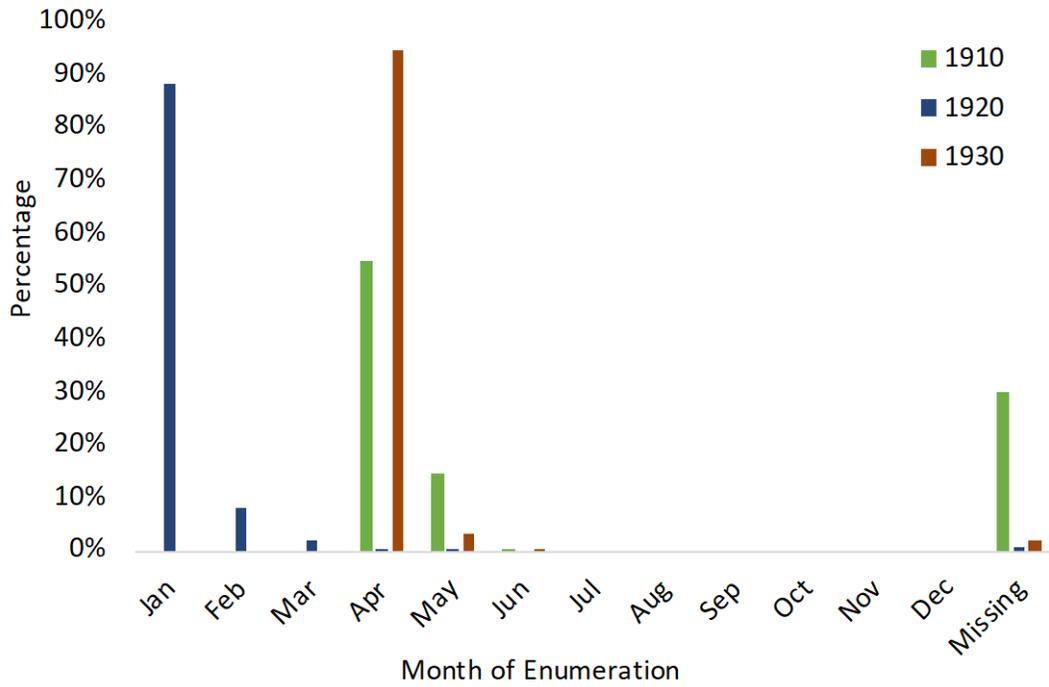
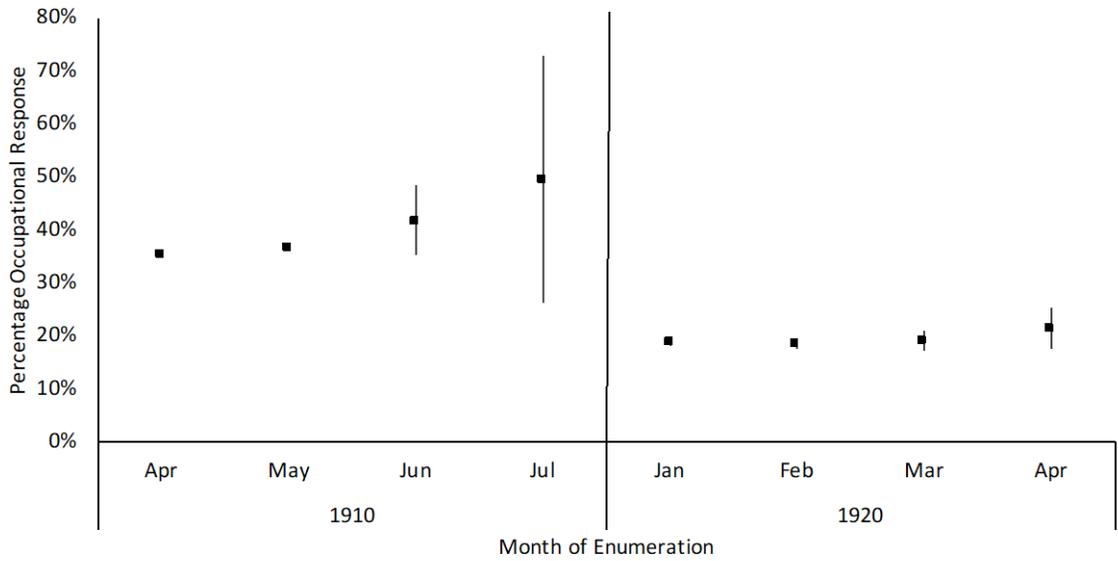


Figure 3-6: Occupational Response Rate for Farm Children by Month of Enumeration, 1910-1920



argued that the change in date was far more important in describing the sharp decline in agricultural laborers between 1910 and 1920 than the change in definition.⁴⁰

Francis Walker, the superintendent of the 1870 and 1880 Census, originally instituted several changes in order to more accurately assess the United States population and prevent undercounting.⁴¹ One of these changes entailed limiting the primary enumeration to a single month. Figures 3-3 through 3-5 show the distribution of enumeration month between 1850 and 1930. The 1850 enumeration was dispersed over several months beginning in July. The 1860 and 1870 censuses show a similar trend, but instead of mostly being spread out in a bell curve, the enumeration began in June and spread through the remaining population at a decreasing rate. 1880 and 1900 are the first years where the majority of the enumeration (over 95%) occurred in June. This was likely the case for 1910 in April, but a large number of records are missing the month of enumeration. As mentioned previously, most of the enumeration occurred in January for the 1920 Census, and primary enumeration reverted to April in the 1930 Census.

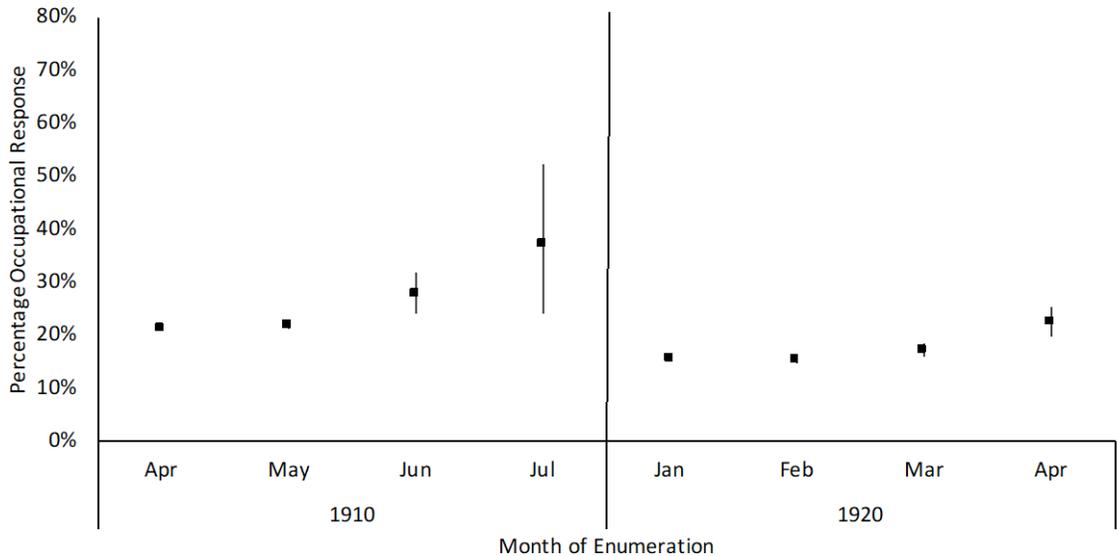
Evidence of the month of enumeration between 1910 and 1920 suggest that overall the month of enumeration biased results. Figure 3-6 shows the occupational response rates for farm children for 1910 and 1920 by month of enumeration. The 1910 Enumeration began in April where approximately 35% of children reported an occupation. In 1920, enumeration began in the month of January, with approximately 19% of farm children reporting an occupation. April, the fourth month of enumeration for the 1920 Census,

⁴⁰ Hill (1929), 16. Alba Edwards, *Children in Gainful Occupations at the Fourteenth Census of the United States*, (Washington DC: Department of Commerce, Bureau of the Census, 1924), 14.

⁴¹ J. David Hacker, "New Estimates of Census Coverage in the United States, 1850-1930" *Social Science History*, 37:1 (2013), 76.

shows comparable rates to January through March. Given that the April occupational response rates were statistically significant and slightly higher than the January rates, the evidence suggests that the month of the enumeration in the 1920 Census biased the occupational responses for children. Figure 3-7 shows occupational response rates by month of enumeration in 1910 and 1920. In fact, while the occupational rate in the first month was lower in 1920 compared to 1910 (15% in Jan 1920 vs 21% in Apr 1910) the April occupational response rate in 1920 was slightly higher than in 1910 (22%). This suggests that the month of enumeration biased results for adult women.

Figure 3-7: Occupational Response Rate for Farm Women by Month of Enumeration, 1910-1920



The agricultural laborer definition was maintained through the 1930 census. Starting in 1940, the class of worker question was further refined, but still failed to alleviate enumerator's interpretations of unpaid labor. In the 1940 Procedural History, Robert Jenkins suggested that

There were also difficulties in obtaining correct reports of unpaid family workers due to discrepancies in enumerator interpretations. These problems were considered to be particularly acute in rural areas where there was a

lack of any clear distinction in the typical farm household between workers in the family enterprise and homemakers or dependents.⁴²

Additionally, the 1940 Census discontinued the “gainfully employed” definition and instead used the “labor force” concept. Here, the labor force was defined as the occupation you worked in the last week, excluding new workers. This change helped the Federal government analyze the actual population looking for work or working, which allowed the government to measure issues related to unemployment. One consequence of this change was seasonal workers were less likely to report an occupation and new workers were excluded altogether.⁴³

The blurred lines of farm and home were still not clearly defined for enumerators by 1940. The 1950 Census finally provided a strict cut off for unpaid labor in terms of hours worked. According to Morris Ullman,

The number of hours worked during the week was a factor in determining whether a person was counted as a worker. The farm operator was considered working if he worked 1 or more hours. The hired worker was counted if he worked any time at all. But the member of the operator's family who worked without pay was counted only if he worked 15 hours or more during the week.⁴⁴

This standard of farm labor and the gendered language of farm labor underreported the labor of women and children likely to fall into this definition. If this definition had been applied retroactively to 1940, 27 percent of spouses would no longer be included as unpaid laborers, compared to 9 percent for sons and daughters. In some capacity, this reflected the

⁴² Robert Jenkins, *Procedural History of the 1940 Census of Population and Housing*, (Madison: The Center for Demography and Ecology, University of Wisconsin, 1983), 97.

⁴³ Anderson-Conk (1978), 115.

⁴⁴ Morris B. Ullman, *The 1950 Censuses - How They Were Taken: Procedural Studies of the 1950 Censuses, No 2*, (Washington D.C.: Department of Commerce, 1955), 80.

changing roles of women's labor force participation and changes in the industrial farm process, but still misrepresented women's work on farms.

Despite all of these issues, the Census remains an extremely rich resource on demographic, economic, and social data for the United States. The systemic biases of enumeration procedures do not limit this vast resource, but researchers need to consider these effects when writing about agricultural labor historically. Additionally, IPUMS provides relationship pointers for spouses and parents as well as its harmonization of occupations, industries, birthplaces, and other fields is extremely valuable for measuring household relationships and tracking change over time and space.

IPUMS-USA codes several occupations the Census considered as "Non-occupational Responses". This includes terms such as "Keeping House", "Retired", "At School", and "At Home" among others. While distinguishing these non-occupational responses help in the measurement of wage labor, these categories excluded an important form of labor from many farm analyses as non-occupational responses. These responses represented a particular aspect of the family farm work force as established above. Any narrative of agricultural work and family relationships must account for these particular responses.

Seasonal farm work was common, with many tasks prioritized based on planting and harvesting. As such, family members worked on farms more seasonally rather than year-round. Because of this, seasonal labor was not enumerated as having a legitimate occupation and the agricultural narrative ignored this in aggregated statistics. Andrew Peterson's sons from Chapter 2, who clearly worked on the farm in these diaries, show up

in the 1880 Census as "At Home".⁴⁵ Tasks could be gender specific, but more often were based on the family composition and need. If a farmer had no sons but several daughters, these daughters completed tasks considered appropriate for men. Women often structured their work on a pattern of weekly chores that were necessary for the farm's success.⁴⁶

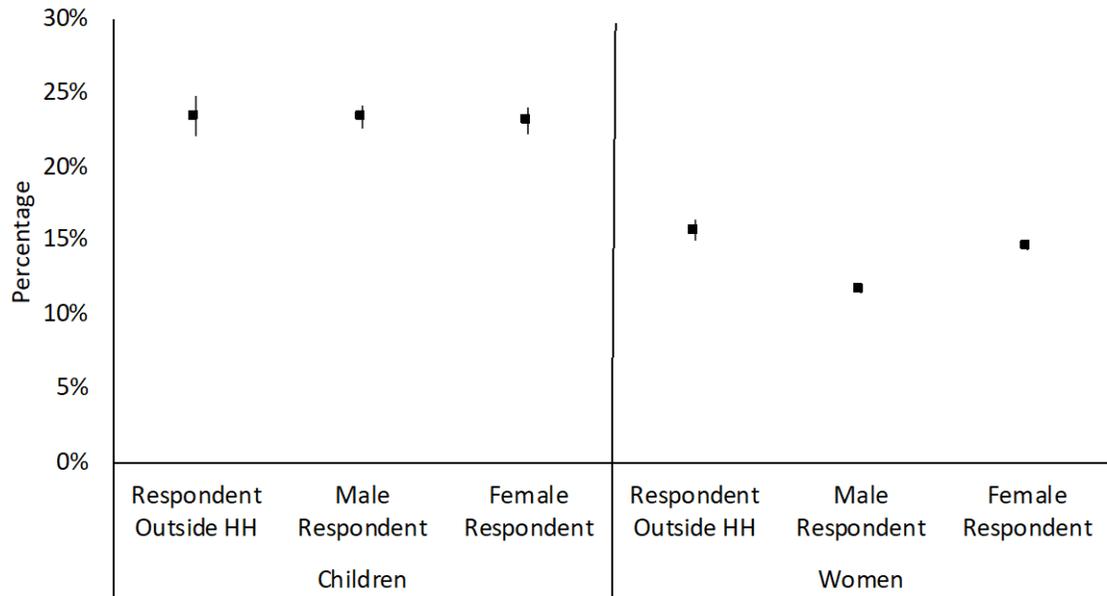
RESPONDENT AND ENUMERATOR BIAS

Since Census responses were self-reported, the household respondent could affect the responses of other individuals. In the 1940 Census, enumerators recorded the respondent for the household, or if the respondent lived outside of the household. Focusing on the sex of the respondent, Figure 3-8 shows the differing occupational response rates for farm women and children based on whether the respondent lived outside of the household, or if the household respondent was male or female. For children, there was no difference between respondents. For women, outside respondents and female respondents recorded 14-15% of farm women with an occupation compared to 12% of male respondents. This small effect suggests that occupational responses overall were not largely biased by respondents.

⁴⁵ Ancestry.com and The Church of Jesus Christ of Latter-day Saints. *1880 United States Federal Census [database on-line]*, Lehi, UT: Ancestry.com Operations Inc, 2010.

⁴⁶ Neth (1995), 26-27.

Figure 3-8: Occupational Response Rates for Farm Women and Children by Sex of Respondent, 1940



While not the primary issue with occupation collection in the Census, one concern to consider is enumerator bias. Typically, the Census Bureau assigned one enumerator to enumerate a designated area. Very rarely did an enumerator enumerate multiple enumeration districts or an enumeration district have multiple enumerators. Language differences can lead to misunderstandings and poor transcription, editing by both enumerators and census clerks, changing enumerator rules, universe restrictions, and inconsistent training procedures could easily lead to bias in occupational outcomes. To test this, I looked at the occupational responses of boys and girls ages 10-17 who were not a head of household and women age 18+ in the Minnesota River Valley in 1880. Given the homogenous economic and demographic conditions of this region (other than slightly higher population densities in the east compared to the western area of the river valley and a few towns), there should not be a lot of variation in occupational responses.

The results however suggest the opposite for farm boys. For instance, in an enumeration district in Carver County, MN, 88% of boys report an occupation (typically farm laborer). In the enumeration district immediately to the south, 2% of boys reported an occupation (Figure 3-9).⁴⁷ While there is some evidence that Swedes in the Minnesota River Valley were less likely to report an occupation for boys compared to Germans, Americans, or British/Irish, the overall variation of occupational responses suggests the Census not accurately reporting work. From an aggregated viewpoint, these differences are hidden, but at the micro-level, researchers using occupation data for children need to consider that enumerator bias played a role in occupational returns.

Figures 3-10 and 3-11 show the results for girls and women. For girls, there are a few enumeration districts with high occupational reporting rates, otherwise, the entire region shows less than 20% of girls reporting an occupation. For women, only one enumeration district returned more than 20% of women with an occupational response. This lack of variation likely reflected top-down gender enumeration biases, but the variation in boys' occupational returns display bottom-up enumerator bias. Figure 3-12 shows a box and whisker plot of the occupational response rates at the enumeration district level for boys, girls, and women.⁴⁸ The results largely conform with Figures 3-9 through

⁴⁷ All of the enumeration district maps were created by the author, verifying the enumeration district boundaries from the original Census forms and using plat maps for Minnesota to create the boundary files. Boundary files available upon request. Ancestry.com and The Church of Jesus Christ of Latter-day Saints. *1880 United States Federal Census [database on-line]*, Lehi, UT: Ancestry.com Operations Inc, 2010. W.W. Hixson & Co., & Minnesota Historical Society, *Plat Book of the State of Minnesota*, (Rockford: W.W. Hixson & Co., 1916). <https://www.lib.umn.edu/borchert/digitized-plat-maps-and-atlases>.

⁴⁸ A box and whisker plot displays the quartile distribution of the data. The middle line inside of the box represents the median or 50th percentile. The bottom horizontal line of the box represents the first quartile or 25th percentile while the top horizontal line of the box represents the third quartile or 75th percentile. The vertical line outside of the box, or the whiskers shows the largest and smallest value outside of the quartiles.

Figure 3-9: Occupational Response Rates for Boys by Enumeration District Minnesota River Valley, 1880

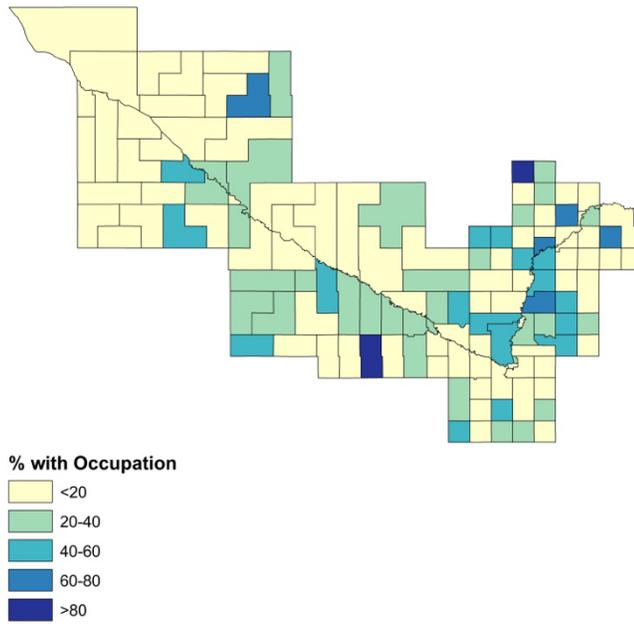


Figure 3-10: Occupational Response Rates for Girls by Enumeration District Minnesota River Valley, 1880

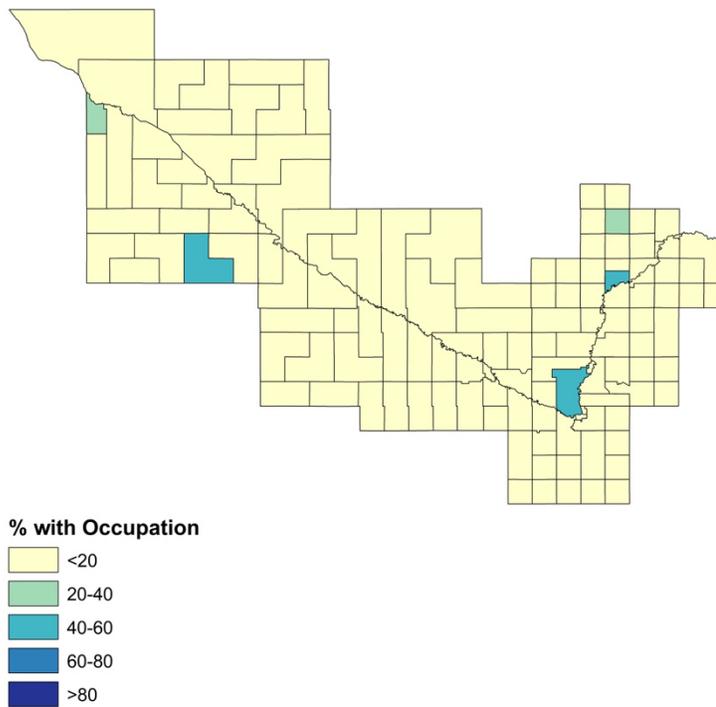


Figure 3-11: Occupational Response Rates for Women by Enumeration District Minnesota River Valley, 1880

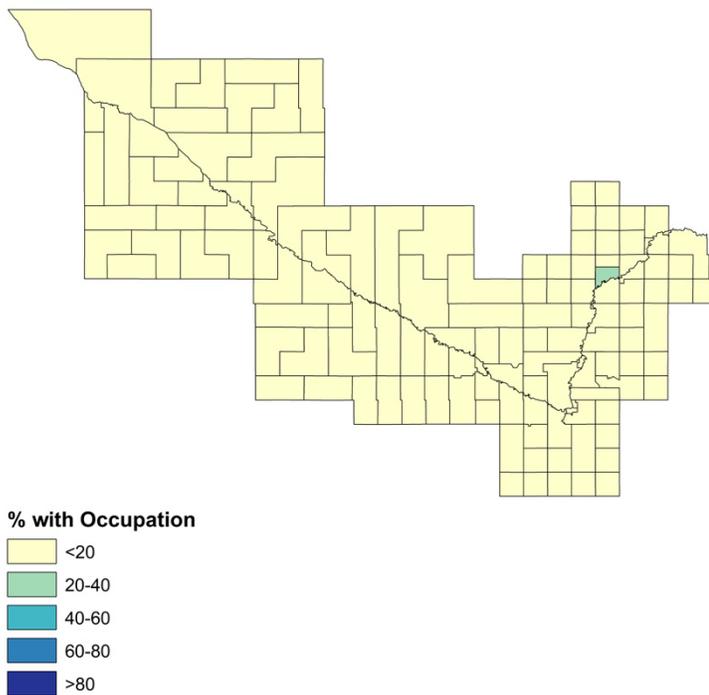
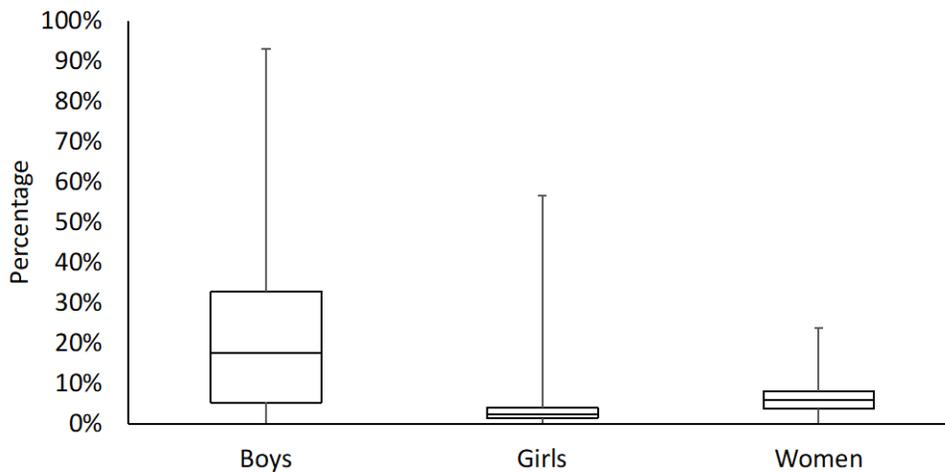


Figure 3-12: Box and Whisker Plot of Enumeration District Occupational Rates by Demographic Group, 1880



3-11. Boys experienced a wider range of occupational responses while girls and women had little variation in their occupational response rates.

To analyze the biases of enumeration month enumerator bias, and sex of respondent, I use the IPUMS-USA 1850-940 samples and the 1880 complete count census data.⁵⁰ I opt to use samples rather than complete count data because of the preliminary nature of occupation coding and variable availability.⁵¹ I split the models by year to analyze different issues. 1860-1870 focuses on the month of enumeration, 1880 on enumerator bias, 1900-1930 on general sociodemographic traits, and 1940 on the sex of the household respondent. Table 3-3 shows the variables used in each model. Age and sex are interacted in the models as well as state and year. Sibling order measures how many older siblings a person has. Educational attainment has been coded as those with less than 8 years of school, those with 8-11 years of schooling, a high school degree, some college, or a college degree or higher. Parental occupation measures whether the parent is a farmer, has a non-farm occupation, has one of the previously describing non-occupational responses, or does not report any occupation in the Census. Marital status captures those who married with the spouse present, married with the spouse absent, divorced, widowed, or never married. Generation refers to the immigrant generation of the individual, based on first generation immigrant, second generation (foreign parents but born in the U.S.) and third or later generation (parents and individual born in the U.S.). Real Estate wealth is the amount of real estate a family owned.

⁵⁰ Steven Ruggles, et al. *Integrated Public Use Microdata Series: Version 7.0 [dataset]*. (Minneapolis: University of Minnesota, 2017).

⁵¹ Preliminary versions of these data means the data are still being coded and tested for errors, and therefore at this stage may be less reliable or introduce uncertain biases into the analysis of occupations.

Table 3-3: Variables for Logistic Model by Year

	1860-1870	1880	1900-1930	1940
Age#Sex	X	X	X	X
Sibling Order	X	X	X	X
Educational Attainment				X
Father Occupation	X	X	X	X
Mother Occupation	X	X	X	X
Marital Status ¹		X	X	X
Generation		X	X	
Family Real Estate Value	X			
State#Year	X		X	X
Month of Enumeration	X			
Enumeration District		X		
HH Respondent Sex				X
Primary Interest	Month of Enumeration	Enumerator Bias	Sociodemographic	HH Respondent Sex

Notes: ¹Only used for adult women age 18+

All of the models are unconditional logistic regression with occupational response as the dependent variable. The 1860 and 1870 IPUMS-USA 1.2% oversamples have the month of enumeration with enough variation to separate the month effects from the year effects. The model estimates occupational responses separately for farm children age 10-17 and farm women over 17. The 1880 IPUMS-USA Complete Count data contains enumeration district which can be used to estimate the effects of enumerator bias. To directly compare with Figures 3-9 through 3-11, I only analyze the Minnesota River Valley. The universes for the three models are boys and girls ages 10-17 with both parents present and women age 18+. Each group has two models. The first model shows the unconditional logistic regression without controlling for enumerator bias, and the second model controls for the enumeration district. The primary concern is how much the model improves (or fails to improve) when controlling for enumeration district. The 1900-1930 model is a general model estimating different socio-demographic variables over a longer span of time. Finally, the 1940 sample has the respondent information available which can be used to estimate the effect of respondent bias by sex.

ANALYSIS

Using the data as recorded from the Census, the traditional census narrative largely supports the view that white men were the primary labor force on farms. The exception to this is in the antebellum period when slaves made up a large, though slightly smaller percentage, of the agricultural labor force than white male farmers. In the mid nineteenth-century, agricultural workers tended to be younger, with an average age of 35, but by 1930 the peak age of farm workers rose to 38. Third generation or older Americans made up the majority of the farm workers, rather than first and second-generation immigrants.⁵² Immigrant farmers tended to be older, with an average age of 47, compared to 37 for second generation or later farm workers.

Slaves made up a large proportion of the agricultural male working force in 1850 at approximately 42%.⁵³ By 1880, African American men and women made up approximately 20% of the agricultural work force. This share declined over the next five decades. Women made up a small part of the agricultural work force at approximately 7%, and mostly consisted of laborers rather than farmers. Farmers rather than farm laborers made up approximately 53 to 57% of the agricultural work force between 1850 and 1930.

Based on the traditional statistics and figures, agriculture was predominantly male and white. The exception to this generalization is the importance of slavery in the antebellum period. Based on this narrative, children played a large role; however, the Census underreported the role children played because of schooling and the biases

⁵² Jon Gjerde, *From Peasants to Farmers: The Migration from Balestrand, Norway to the Upper Middle West*. (Cambridge: Cambridge University Press, 1985). D. Aidan McQuillan, *Prevailing over Time: Ethnic Adjustment on the Kansas Prairies, 1875-1925*, (Lincoln: University of Nebraska Press, 1990). Robert Clifford Ostergren, *A Community Transplanted: The Trans-Atlantic Experience of a Swedish Immigrant Settlement in the Upper Middle West, 1835-1915*, (Madison: University of Wisconsin Press, 1988).

⁵³ Russell Menard, et al., *Public Use Microdata Samples of the Slave Population of 1850-1860*, (Minneapolis: Minnesota Population Center, University of Minnesota, 2004), <http://usa.ipums.org/usa/slavepums>.

described above. Adult women were largely absent in this narrative, being relegated to the unmeasured “Keeping House” category. To understand the importance of women and children, historians of the family and agriculture must include family housework because of how household work interacted with agricultural work.⁵⁴

The following figures (3-13 through 3-15)⁵⁵ show the distribution of occupational responses for farm boys and girls between the age of 10-17 and for farm women age 18+ respectively. Because of the intertwining nature of agricultural and household work, it is unlikely that these non-occupational response individuals were not working during specific seasons such as planting or harvest. These groups also worked within the household and produced farm commodities such as butter, dairy, and eggs.⁵⁶ Any agricultural response (Farmer, Farm Laborer) was considered an “Agricultural” response. The non-occupational responses (Keeping House, At Home, At School) are categorized as “Non-occupational.” All other occupations are considered “Non-agricultural” responses, and blank responses represent no occupation. Many farm boys reported an occupation, typically averaging around 40% of boys from 1880 until 1910. Occupational reporting among farm boys declined to around 25% of boys in 1920. Non-agricultural occupations were relatively small throughout the entire time period for farm boys. Non-occupational responses made up a large proportion of occupations, especially in 1880 and 1900. The primary non-occupational responses were “At Home” or “At School.” Starting in 1910, non-occupational responses were rarely collected. Both farms girls under 18 and women over

⁵⁴ Lu Ann Jones, *Mama Learned Us to Work: Farm Women in the New South*, (Chapel Hill: University of North Carolina Press, 2001), 2-6. Paul C. Rosenblatt, *Farming is in Our Blood: Farm Families in Economic Crisis*, (Ames: Iowa State University Press, 1990), 53-68.

⁵⁵ 1890 values are averaged between 1880 and 1900. Because of the evolution of occupation instructions, it’s likely the 1890 rates were closer to the 1880 rates rather than average between 1880 and 1900.

⁵⁶ Conklin (2008), 33.

Figure 3-13: Occupational Classification for Farm Boys Age 10-17, 1860-1930

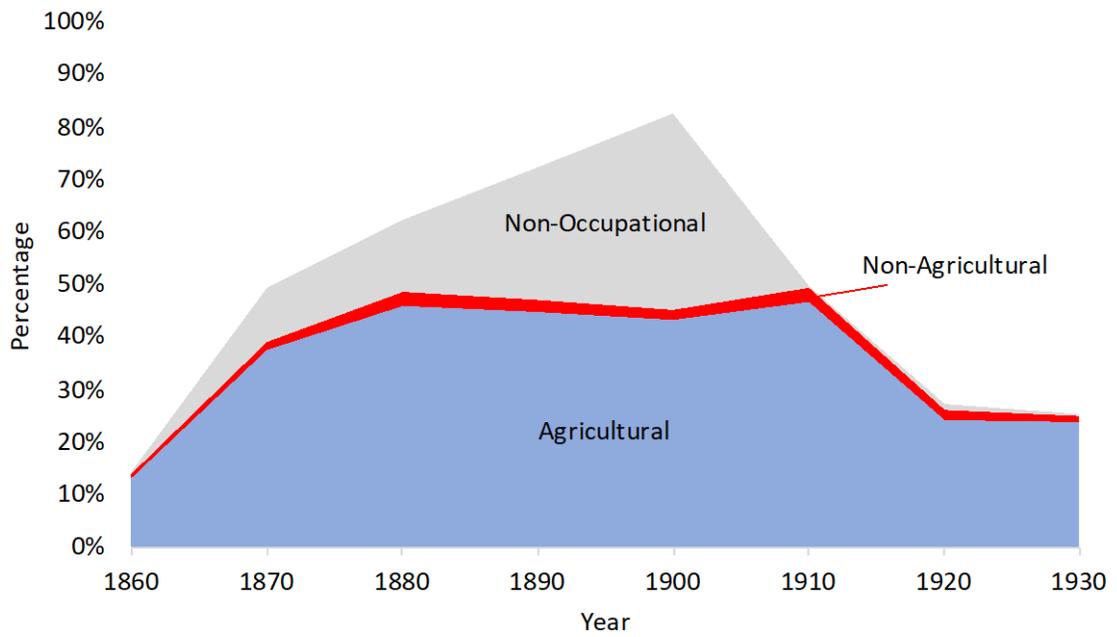


Figure 3-14: Occupational Classification for Farm Girls Age 10-17, 1860-1930

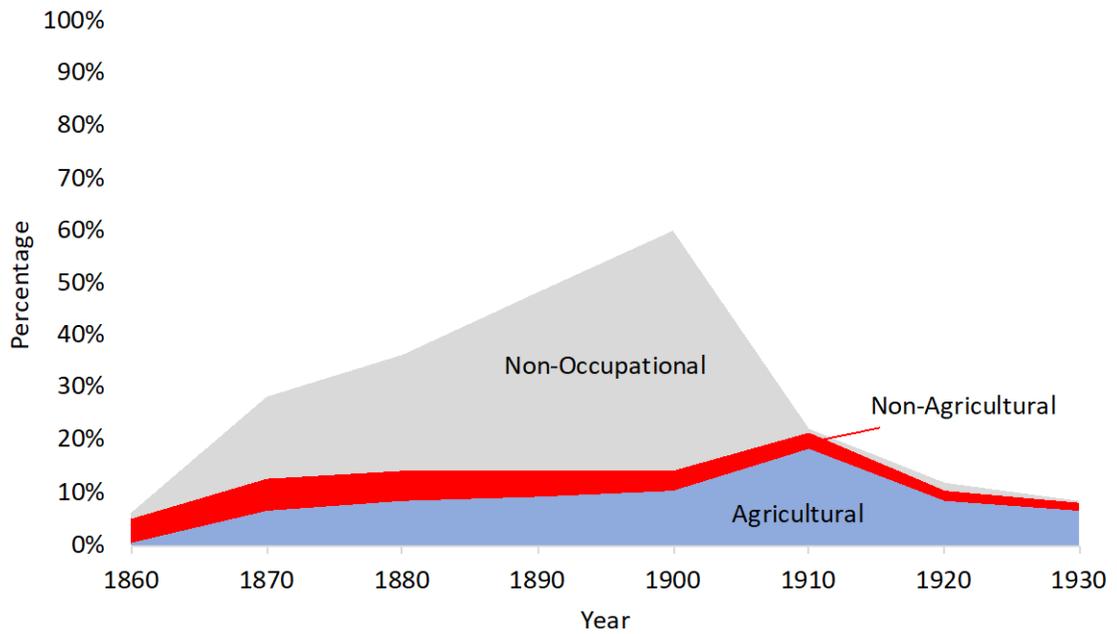
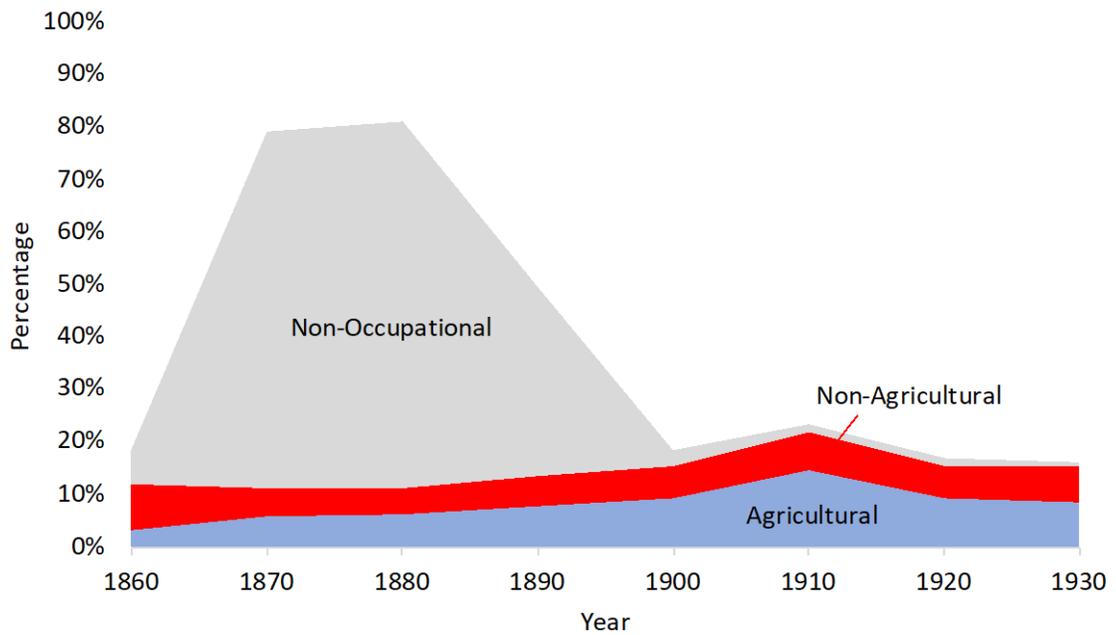


Figure 3-15: Occupational Classification for Farm Women Age 18+, 1860-1930



18 largely reported no occupation, agricultural or non-agricultural. The highest rate was in 1910 at around 22% of girls and women reported an occupation. While women over 18 had high rates of non-occupational responses because of “Keeping House,” this response was rarely given to younger girls.

1860-1870 MODEL-MONTH OF ENUMERATION

The means and the 1860-1870 logistic model output (Tables 3-4 through 3-5)⁵⁷ measures the effect of the month of enumeration on occupational reporting. For children, the model controls for age, sex, school attendance, race, mother and father occupation,

⁵⁷ Because many women and children did not report an occupation, the classification tables require additional explanation. Because of the high numbers of people who did not report an occupation, specificity rates are high and false positive rates are low because many did not have an occupation. Alternatively, sensitivity rates are low and false negative rates are high, however, because affirmative occupational responses are low, the overall correctly classified appears very high. It’s important to consider these relative measures, but also keep them in perspective.

wealth⁵⁸, state, and year. Figure 3-16 reports the predicted probabilities of having an occupational response for selected variables for farm children.

Table 3-4: Means of Variables by Regression, 1860-1870

		Children	Adult Women
Occupation Response		0.1639	0.1171
Sex	Male	0.5222	-
	Female	0.4778	1.0000
Age		13.22	36.21
Race	White	0.9078	0.8970
	Black	0.0919	0.1025
	American Indian	0.0002	0.0005
	Chinese	0.0000	-
Sibling Order		1.57	0.14
Father	Farm	0.9626	0.1492
Occupation	Non-farm	0.0335	0.0061
	Non-Occ	0.0008	0.0015
	No Occ	0.0031	0.0044
	Parent Not Present	-	0.8388
Mother	Farm	0.0215	0.0094
Occupation	Non-farm	0.0178	0.0049
	Non-Occ	0.5829	0.0887
	No Occ	0.3778	0.0720
	Parent Not Present	-	0.8249
Ln Family Real Estate		5.52	5.29
Month of Enumeration	Jan	0.0001	0.0003
	Feb	0.0001	0.0001
	Mar	0.0006	0.0005
	April	-	0.0001
	May	-	-
	June	0.3068	0.3189
	July	0.3676	0.3673
	August	0.2516	0.2429
	September	0.0533	0.0500
	October	0.0098	0.0099
	November	0.0019	0.0023
	December	0.0011	0.0010
	Missing	0.0071	0.0068
State Dummies	Yes	Yes	
Year Dummies	Yes	Yes	
Enumeration District Dummies	No	No	
Primary Interest	Enumeration Month		
N	52,293	93,473	

⁵⁸ The natural log of real estate property was used in the model. Missing values were replaced as 0. Sibling order, mother and father occupation were determined using *MOMLOC* and *POPLOC*.

Figure 3-17 displays the predicted probabilities for farm women over the age of 17 in 1860-1870. We unfortunately do not have marital status which plays a large role in other models. Interestingly, when the mother was reported having a non-farm occupation, adult women had a 41.8% chance of reporting an occupation compared to 23.8% for a mother with a farmer occupation. Black farm women had a 46.5% predicted probability compared to only 8.8% for white farm women. The month of enumeration predicted probabilities averaged around 12.1%, but varied between 10.6% and 12.4% between the months of June and August. Given the ranges in the predicted probabilities, the month of enumeration did affect occupational responses.

Table 3-5: Logistic Model Occupational Response 1860-1870

		Children			Adult Women		
		OR	S.E.	Sig	OR	S.E.	Sig
Sex#Age	Male	1.727	0.014	***			
	Female	1.486	0.012	***	0.981	0.001	***
Race	White	Ref.			Ref.		
	Black	3.922	0.246	***	11.65	0.505	***
	American Indian	1.376	1.915		2.095	1.397	
Sibling Order		0.989	0.013		1.066	0.028	*
Family Real Estate Value		0.971	0.0056	***	1.075	0.005	***
Father Occupation	Farmer	Ref.			Ref.		
	Non-farm	2.143	0.161	***	1.346	0.196	*
	Non-occ	1.027	0.672		1.135	0.345	
	No Occ	1.258	0.372		0.514	0.114	**
Parent Not Present					0.876	0.044	**
Mother Occupation	Farmer	Ref.			Ref.		
	Non-farm	0.444	0.059	***	2.665	0.428	***
	Non-occ	0.250	0.021	***	0.524	0.056	***
	No Occ	0.095	0.009	***	0.261	0.028	***
Parent Not Present					0.350	0.033	***
Month of Enumeration	January	Ref.			Ref.		
	February	37.56	43.757	***	0.459	0.327	
	March	1.273	1.746		0.236	0.167	*
	April				0.173	0.189	
	May						
	June	11.92	10.227	**	0.382	0.136	**
	July	12.94	11.097	**	0.362	0.129	**
	August	12.12	10.398	**	0.312	0.111	***
	September	10.44	8.986	**	0.335	0.120	**
	October	11.68	10.291	**	0.338	0.261	**
	November	7.090	6.645	*	0.408	0.169	*
	December	9.870	9.623	*	0.478	0.029	
Missing		8.002	7.047	*	0.346	0.132	***
Constant		0.000	0.000	***	1.154	0.475	
<i>N</i>		52,287			93,473		
Log Likelihood		-1362878			-2560113		
Pseudo R ²		0.346			0.144		
Sensitivity		41.39%			11.73%		
Specificity		95.79%			98.89%		
Positive Predictive Value		65.82%			58.38%		
Negative Predictive Value		89.29%			89.42%		
False Positive Rate		4.21%			1.11%		
False Negative Rate		58.61%			88.27%		
Correctly Classified		86.87%			88.69%		
ROC		0.888			0.756		
AIC		2725924			5120421		
BIC		2727046			5121786		

Figure 3-16: Predicted Probabilities for Farm Children Occupational Responses, 1860-1870

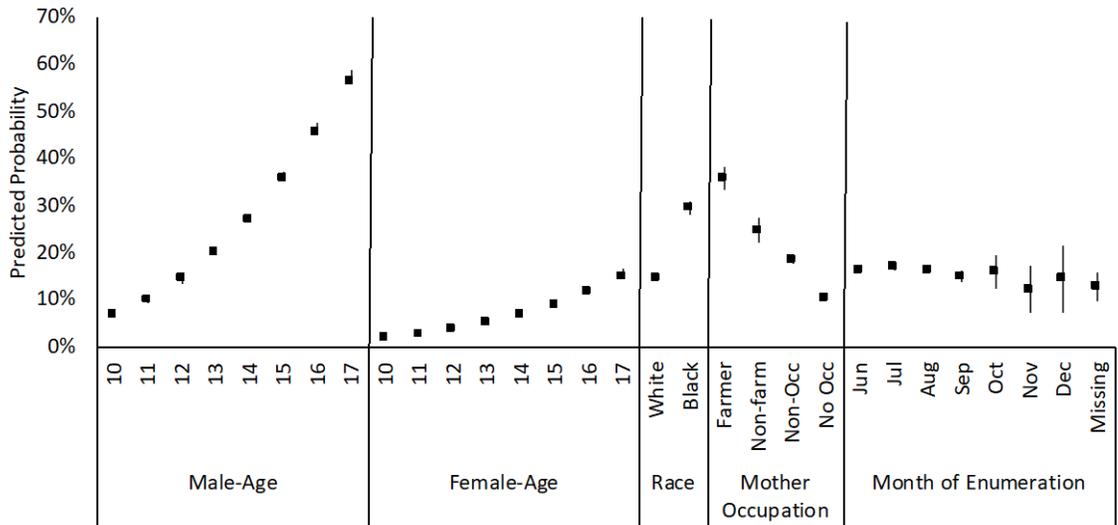
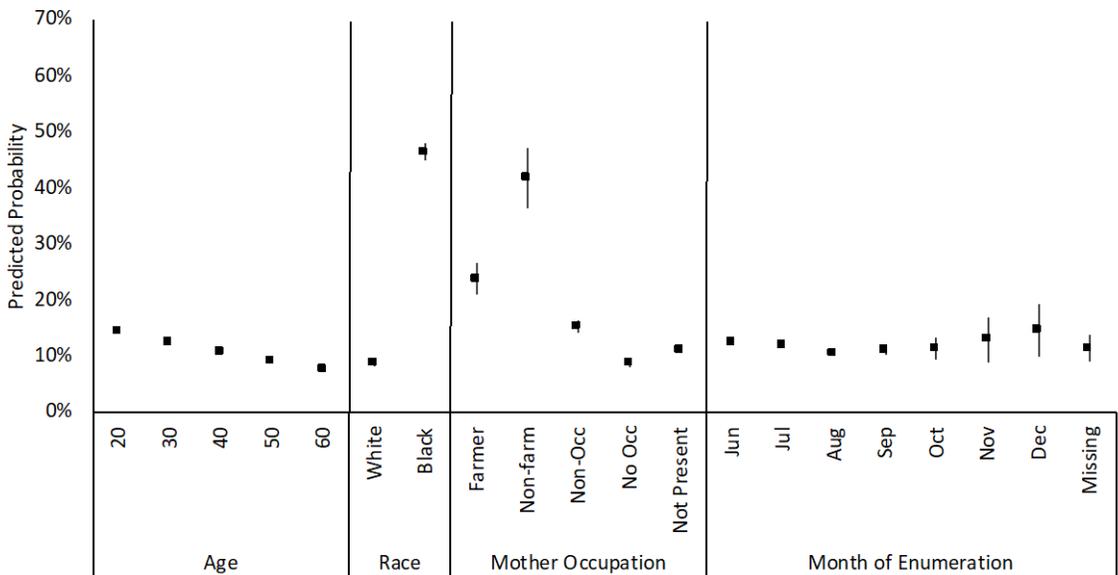


Figure 3-17: Predicted Probabilities for Farm Women Age 18+ Occupational Responses, 1860-1870



1880 MODEL-ENUMERATOR BIAS

The 1880 Complete Count model estimates the effect of enumerator bias by controlling the enumeration district. Table 3-6 shows the means of the variables in the regression, and Tables 3-7 through 3-9 below show the logistic results for boys, girls, and women. I include diagnostics to show how controlling for the enumeration district improves the model.

Table 3-6: Means of Variables by Regression, 1880

		Boys	Girls	Women
Occupation Response		0.2560	0.0524	0.0550
Age		13.23	13.11	36.95
Sibling Order		1.60	1.61	0.10
Generation	1st	0.1925	0.1841	0.6371
	2nd	0.6539	0.6496	0.1817
	3rd +	0.1536	0.1663	0.1812
Father Occupation	Farm	0.9817	0.9818	0.1309
	Non-farm	0.0136	0.0148	0.0020
	Non-Occ	0.0008	0.0005	0.0013
	No Occ	0.0039	0.0030	0.0050
	Parent Not Present	-	-	0.8608
Mother Occupation	Farm	0.0020	0.0022	0.0026
	Non-farm	0.0009	0.0017	0.0003
	Non-Occ	0.9617	0.9865	0.1235
	No Occ	0.0354	0.0096	0.0188
	Parent Not Present	-	-	0.8548
Marital Status	Married Spouse Present	-	-	0.7565
	Married Spouse Absent	-	-	0.0131
	Divorced	-	-	0.0017
	Widowed	-	-	0.0558
	Never Married/Single	-	-	0.1730
	State Dummies	No	No	No
	Year Dummies	No	No	No
	Enumeration District Dummies	Yes	Yes	Yes
	Primary Interest	Enumeration District		
	N	7,988	4,064	23,514

Table 3-7 looks at all boys in the Minnesota River Valley. Including the enumeration district in the model reduces the percentage of false negative predictions from 71.0% to 29.8%. Every diagnostic shows either a large improvement or no change in the predictive diagnostics. Most of the predicted probabilities were within one percentage points, but a few responses (father's non-agricultural occupation, father has no occupation, mother's farmer occupation, mother's no occupation) saw increases ranging from 4% to

nearly 9 percentage points. The predicted probabilities of enumeration districts closely mirror the actual occupational response rates for enumerations districts.

Table 3-7: Logistic Regression Occupational Response Results for Boys in MN River Valley, 1880

	OR	S.E.	Sig.	OR	S.E.	Sig.
Age	1.548	0.021	***	2.098	0.047	***
Sibling Order	0.953	0.021	*	0.911	0.027	***
1st	Ref.			Ref.		
Generation 2nd	1.018	0.073		0.891	0.090	
3rd +	0.917	0.088		0.769	0.105	
Father Farmer	Ref.			Ref.		
Non-farm	2.895	0.626	***	1.354	0.373	
Occupation Non-Occ	0.669	0.762		0.199	0.333	
No Occ	5.333	2.345	***	8.811	4.804	***
Mother Farmer	Ref.			Ref.		
Non-farm	5.072	7.473		1.499	2.400	
Occupation Non-Occ	6.096	6.477		3.792	4.567	
No Occ	1.314	1.424		2.219	2.764	
Constant	0.000	0.000	***	0.000	0.000	***
ED Fixed Effects	No			Yes		
N	7,988			7,988		
Log Likelihood	-3848.227			-2360.553		
Pseudo R ²	0.153			0.481		
Sensitivity	29.0%			70.2%		
Specificity	92.0%			93.3%		
Positive Predictive Value	55.4%			78.3%		
Negative Predictive Value	79.0%			90.1%		
False Positive Rate	8.0%			6.7%		
False Negative Rate	71.0%			29.8%		
Correctly Classified	75.8%			87.4%		
ROC	0.765			0.925		
AIC	7718			4963		
BIC	7795			5808		

Table 3-8 shows the results for girls. The first model is very poor where the model predicts that no girl should have an occupation response. In this scenario, controlling for the enumeration district is very important to explain occupational responses. The highest probability for a girl reporting an occupation was her age, with a 13.2% chance of returning an occupation at age 17. Having no older siblings gave girls a 4.8% chance of returning an occupation compared to 2.9% of girls with 5 older siblings. Generation, father occupation, and mother occupation all had small effects on occupational reporting for girls.

Table 3-8: Logistic Regression Occupational Response Results for Girls in MN River Valley, 1880

	OR	S.E.	Sig.	OR	S.E.	Sig.
Age	1.444	0.052	***	1.677	0.077	***
Sibling Order	0.873	0.053	*	0.877	0.064	
Generation						
1st			Ref.			Ref.
2nd	0.941	0.163		0.863	0.194	
3rd +	0.563	0.147	*	0.902	0.291	
Father Occupation						
Farmer			Ref.			Ref.
Non-farm	2.988	1.221	**	2.137	1.029	
Non-Occ ¹						
No Occ	4.267	3.452		4.293	4.147	
Mother Occupation						
Farmer			Ref.			Ref.
Non-farm	2.452	3.724		3.220	5.959	
Non-Occ	0.608	0.664		1.059	1.379	
No Occ	0.260	0.390		0.347	0.631	
Constant	0.001	0.001	***	0.000	0.000	***
ED Fixed Effects			No			Yes
N		4,062			4,062	
Log Likelihood		-754.522			-542.355	
Pseudo R ²		0.097			0.351	
Sensitivity		0.5%			30.5%	
Specificity		100.0%			99.0%	
Positive Predictive Value		100.0%			63.7%	
Negative Predictive Value		94.8%			96.3%	
False Positive Rate		0.0%			1.0%	
False Negative Rate		99.5%			69.5%	
Correctly Classified		94.8%			95.5%	
ROC		0.743			0.895	
AIC		1529			1227	
BIC		1592			1675	

Notes: ¹Father with non-occupation predicts failure perfectly, omitted from model

Table 3-9 for adult women shows slightly conflicting results. While the log likelihood, pseudo R squared, and area under the ROC curve show small improvements in the model, other measures such as the false negative rate and correctly classified show a small decline in performance. Given the results from Figure 3-11, this is not entirely surprising. The largest predictor of reporting an occupation for an adult woman was marital status. Never married/single women had a 43.7% chance of reporting an occupation,

Table 3-9: Logistic Regression Occupational Response Results for Women in MN
River Valley, 1880

		OR	S.E.	Sig.	OR	S.E.	Sig.
Age		0.954	0.003	***	0.950	0.004	***
Sibling Order		0.798	0.050	***	0.776	0.051	***
Generation	1st	Ref.			Ref.		
	2nd	0.598	0.053	***	0.609	0.059	***
	3rd +	1.062	0.097		1.135	0.121	
Father Occupation	Farmer	Ref.			Ref.		
	Non-farm	2.911	1.165	**	2.479	1.054	*
	Non-Occ						
	No Occ	2.657	1.083	*	2.818	1.214	*
	Not Present	4.975	0.402	***	5.980	0.841	***
Mother Occupation	Farmer	Ref.			Ref.		
	Non-farm	13.513	19.12		10.634	17.06	
	Non-Occ	2.790	1.083	**	4.604	1.872	***
	No Occ	1.972	0.880		2.608	1.223	*
	Not Present	5.372	2.011	***	8.653	3.382	***
Marital Status	Married, Spouse present	Ref.			Ref.		
	Married, Spouse absent	77.085	14.71	***	96.169	19.22	***
	Divorced	151.06	62.87	***	222.957	102.3	***
	Widowed	110.06	17.00	***	135.248	21.93	***
	Never Married/Single	168.01	21.38	***	212.551	28.44	***
Constant		0.001	0.000	***	0.002	0.001	***
ED Fixed Effects		No			Yes		
N		23,483			23,483		
Log Likelihood		-3025.637			-2806.309		
Pseudo R ²		0.396			0.439		
Sensitivity		35.9%			36.4%		
Specificity		98.8%			99.0%		
Positive Predictive Value		64.3%			67.3%		
Negative Predictive Value		96.4%			96.4%		
False Positive Rate		1.2%			1.0%		
False Negative Rate		64.1%			63.7%		
Correctly Classified		95.4%			95.5%		
ROC		0.914			0.932		
AIC		6083			5909		
BIC		6212			7102		

compared to 0.7% for married women with spouse present, 18.8% married women with spouse absent, 30.3% for divorced women, and 23.1% for widowed women. All of the other variables show predicted probabilities less than 10% of an occupational response. Based on the results seen here, while the predicted probabilities in general are not largely affected by the inclusion of the enumeration district, the model clearly performs better for boys and girls with little to no improvement for adult women. Enumerator bias played an

important role as someone living in one enumeration district could be far more likely to report an occupation than in another simply because of whom the enumerator was.

1900-1930 MODEL-GENERAL MODEL

Table 3-10: Means of Variables by Regression, 1900-1930

		Children	Adult Women
Occupation Response		0.2304	0.1711
Sex	Male	0.5212	-
	Female	0.4788	1.0000
Age		13.30	38.40
Race	White	0.8332	0.8330
	Black	0.1626	0.1624
	American Indian	0.0034	0.0036
	Chinese	0.0001	0.0001
	Japanese	0.0006	0.0007
	Other Asian	0.0000	0.0001
	Other Race	0.0001	0.0001
Sibling Order		1.49	0.12
Generation	1st	0.0117	0.0824
	2nd	0.1346	0.1255
	3rd +	0.8537	0.7922
Father Occupation	Farm	0.9648	0.1377
	Non-farm	0.0303	0.0055
	Non-Occ	0.0004	0.0006
	No Occ	0.0045	0.0074
	Parent Not Present	-	0.8489
Mother Occupation	Farm	0.0610	0.0199
	Non-farm	0.0138	0.0036
	Non-Occ	0.0125	0.0019
	No Occ	0.9127	0.1420
	Parent Not Present	-	0.8326
Marital Status	Married Spouse Present	-	0.7002
	Married Spouse Absent	-	0.0167
	Divorced	-	0.0052
	Widowed	-	0.0929
	Never Married/Single	-	0.1851
	State Dummies	Yes	Yes
	Year Dummies	Yes	Yes
	Enumeration District Dummies	No	No
	Primary Interest	Sociodemographic	
	N	622,513	1,040,541

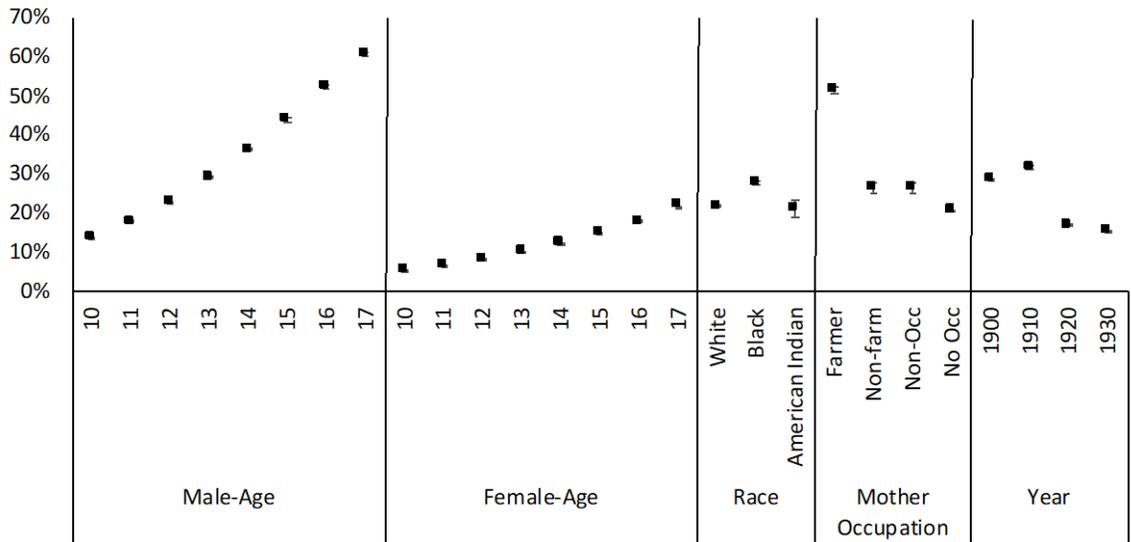
Table 3-11: Logistic Model Occupational Response 1900-1930

		Children			Adult Women		
		OR	S.E.	Sig	OR	S.E.	Sig
Sex#Age	Male	1.526	0.004	***			
	Female	1.338	0.003	***	0.973	0.000	***
Race	White	Ref.			Ref.		
	Black	1.599	0.031	***	5.582	0.071	***
	American Indian	0.951	0.087		1.797	0.11	***
	Chinese	0.689	0.291		2.235	0.642	**
	Japanese	0.428	0.177	*	3.361	0.47	***
	Other Asian	0.387	0.230		6.667	3.524	***
	Other Race	0.044	0.027	***	1.837	1.141	
Sibling Order		0.993	0.005		0.800	0.008	***
Generation	1st	Ref.			Ref.		
	2nd	0.652	0.035	***	0.963	0.019	
	3rd +	0.557	0.029	***	0.852	0.016	***
Father Occupation	Farmer	Ref.			Ref.		
	Non-farm	1.563	0.047	***	2.122	0.096	***
	Non-occ	2.398	0.512	***	1.529	0.245	**
	No Occ	1.186	0.115		1.560	0.084	***
	Parent Not Present				2.225	0.045	***
Mother Occupation	Farmer	Ref.			Ref.		
	Non-farm	0.203	0.011	***	1.508	0.097	***
	Non-occ	0.204	0.012	***	1.197	0.104	*
	No Occ	0.130	0.004	***	0.875	0.026	***
	Parent Not Present				1.167	0.032	***
Marital Status	Married, Spouse present				Ref.		
	Married, Spouse absent				14.52	0.359	***
	Divorced				27.06	1.158	***
	Widowed				19.44	0.289	***
	Never Married/Single				15.69	0.238	***
Constant		0.012	0.002	***	0.071	0.006	***
N		622,513			1,040,541		
Log Likelihood		-7410443			-11010000		
Pseudo R ²		0.306			0.281		
Sensitivity		46.62%			31.77%		
Specificity		93.63%			96.48%		
Positive Predictive Value		68.67%			65.08%		
Negative Predictive Value		85.41%			87.26%		
False Positive Rate		6.37%			3.52%		
False Negative Rate		53.38%			68.23%		
Correctly Classified		82.79%			85.41%		
ROC		0.862			0.854		
AIC		14821282			22020396		
BIC		14823528			22022743		

Table 3-10 shows the means of variables for the 1900-1930 and the model results in Table 3-11. Given the short time periods of the other models, this model focuses on the socio-demographic effects on occupational responses. The results largely coincide with the other models and previous discussion. Older children were more likely to report an occupation than younger children, and those who did not attend school were more likely to report an occupation than those who attended school. The 1910 enumeration had a

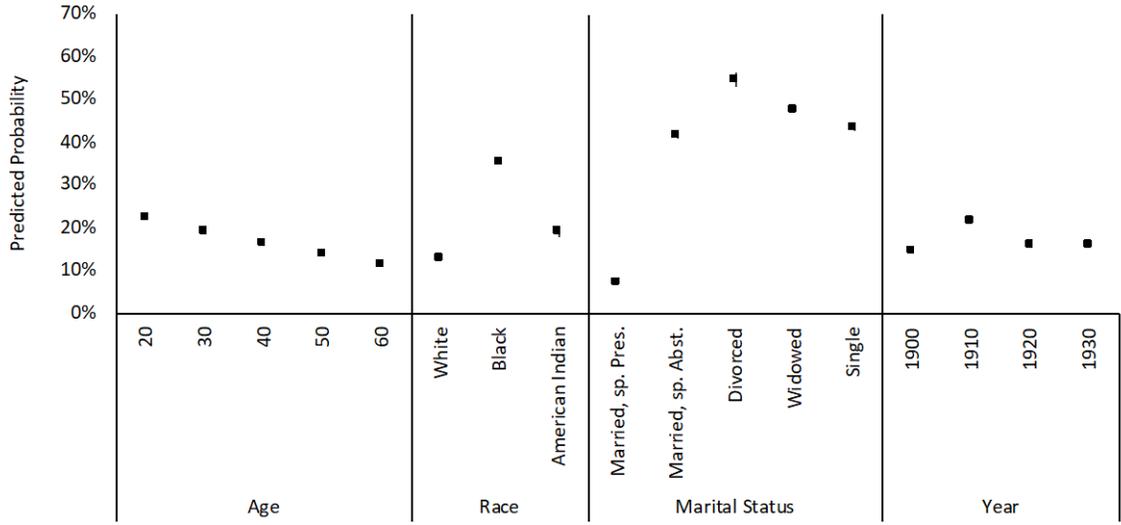
noticeable bias on occupational response rates, with a sharp decline in 1920 and 1930. Finally, having a mother as a farmer was one of the most important predictors of reporting an occupation. For adult women, the probability of reporting an occupation decline with age, and being divorced, widowed, single, or married with a spouse absent had a higher chance of an occupation than a married woman with spouse present. Black women had a significantly higher chance of an occupation, likely reflecting the 1910 census returns which were primarily driven by higher occupational responses in the South.⁶²

Figure 3-18: Occupational Response Predicted Probabilities for Selected Variables for Farm Children, 1900-1930



⁶² Sobek (1997), 38-44.

Figure 3-19: Occupational Response Predicted Probabilities for Selected Variables for Farm Women, 1900-1930



1940 MODEL-SEX OF HOUSEHOLD RESPONDENT

Table 3-12 shows the means of the variables of the 1940 model. Table 3-13 estimates the effects of educational attainment and the sex of the household respondent on occupational outcomes for farm children age 14-17 and farm women age 18+ using the 1940 sample. Figure 3-20 shows the predicted probabilities for selected variables for farm children, and Figure 3-21 shows the results for farm women. For boys, the predicted probability of an occupational response at age 17 is approximately 56.1% compared to approximately 13.9% for 14-year-old boys. Regarding the sex of the respondent, the predicted probability of an occupational response if the household respondent was outside the household or was male was approximately 32.6 and 32.8% respectively, compared to a 29.4% if the household respondent was female. Having a mother with a farmer occupation increased the probability of an occupational response by 43.2%. Educational attainment did not have large effects for children, probably because most children were still in school and had not obtained a high school degree.

Table 3-12: Means of Variables by Regression, 1940

		Children	Adult Women
Occupation Response		0.2149	0.1377
Sex	Male	0.5294	-
	Female	0.4706	1.0000
Age		15.45	39.97
Race	White	0.8390	0.8185
	Black	0.1532	0.1755
	American Indian	0.0050	0.0046
	Chinese	-	0.0001
	Japanese	0.0028	0.0012
Sibling Order		1.18	0.11
Father	Farm	0.9458	0.1288
Occupation	Non-farm	0.0365	0.0055
	Non-Occ	-	-
	No Occ	0.0178	0.0124
	Parent Not Present	-	0.8533
Mother	Farm	0.0324	0.0111
Occupation	Non-farm	0.0194	0.0038
	Non-Occ	-	-
	No Occ	0.9482	0.1454
	Parent Not Present	-	0.8397
Marital Status	Married Spouse Present	-	0.7273
	Married Spouse Absent	-	0.0205
	Divorced	-	0.0066
	Widowed	-	0.0851
	Never Married/Single	-	0.1605
Educational Attainment	<8 years	0.6329	0.6845
	9-11 Years	0.3442	0.1446
	High School	0.0219	0.1134
	Some College	0.0010	0.0456
	College Degree	-	0.0119
Sex of Respondent	Outside Household	0.1563	0.1690
	Male	0.5472	0.5251
	Female	0.2965	0.3060
	State Dummies	Yes	Yes
	Year Dummies	No	No
	Enumeration District Dummies	No	No
	Primary Interest	HH Respondent Sex	
	N	9,232	63,631

For girls, the predicted probability of an occupational response at age 17 was approximately 14.8% compared to approximately 4.3% for 14-year-old girls. Regarding the sex of the respondent, the predicted probability of an occupational response if the household respondent was outside the household or was male was approximately 8.4 and

8.6% respectively, compared to a 7.3% if the household respondent was female. This is the opposite effect compared to boys and adult women.

Table 3-13: Logistic Model Occupational Response 1940

		Children			Adult Women		
		OR	S.E.	Sig	OR	S.E.	Sig
Sex#Age	Male	2.242	0.077	***			
	Female	1.616	0.089	***	0.974	0.001	***
Race	White	Ref.			Ref.		
	Black	1.089	0.104		2.971	0.115	***
	American Indian	0.528	0.263		1.943	0.344	***
	Chinese				4.860	4.946	
	Japanese	0.156	0.193		2.068	0.721	*
Sibling Order		0.979	0.026		0.836	0.022	***
Educational Attainment	Less than 8 Years	Ref.			Ref.		
	9-11 Years	0.193	0.017	***	0.869	0.038	***
	High School	0.327	0.075	***	1.506	0.064	***
	Some College	0.250	0.221		2.657	0.149	***
	College 4+				5.028	0.445	***
Father Occupation	Farmer	Ref.			Ref.		
	Non-farm	1.984	0.290	***	1.560	0.218	***
	No Occ	2.114	0.389	***	1.717	0.193	***
	Parent Not Present				1.832	0.112	***
Mother Occupation	Farmer	Ref.			Ref.		
	Non-farm	0.365	0.365	***	1.085	0.206	
	No Occ	0.221	0.221	***	0.799	0.087	*
	Parent Not Present				0.726	0.078	**
Marital Status	Married, Spouse present	Ref.			Ref.		
	Married, Spouse absent				8.740	0.598	***
	Divorced				14.748	1.671	***
	Widowed				9.446	0.457	***
	Never Married/Single				9.166	0.453	***
Sex of Respondent# Sex	Outside HH#Male	Ref.			Ref.		
	Outside HH#Female	23.64	23.73	**			
	Male#Male	0.986	0.103				
	Male#Female	25.13	25.00	***	0.844	0.032	***
	Female#Male	0.859	0.093				
	Female#Female	20.13	20.05	**	1.098	0.043	*
Constant		0.000	0.000	***	0.273	0.067	***
N		9,232			63,631		
Log Likelihood		-316323			-1897771		
Pseudo R ²		0.254			0.221		
Sensitivity		41.63%			21.92%		
Specificity		94.85%			97.43%		
Positive Predictive Value		68.85%			57.69%		
Negative Predictive Value		85.58%			88.66%		
False Positive Rate		5.15%			2.57%		
False Negative Rate		58.37%			78.08%		
Correctly Classified		83.41%			87.04%		
ROC		0.833			0.825		
AIC		632769			3795681		
BIC		633477			3796635		

The primary indicator of occupation for adult women was marital status; those who were divorced having a 43.5% chance of an occupation. Educational attainment was very important, with women who had a college degree having a 33.3% chance of reporting an

Figure 3-20: Occupational Response Predicted Probabilities for Selected Variables for Farm Children, 1940

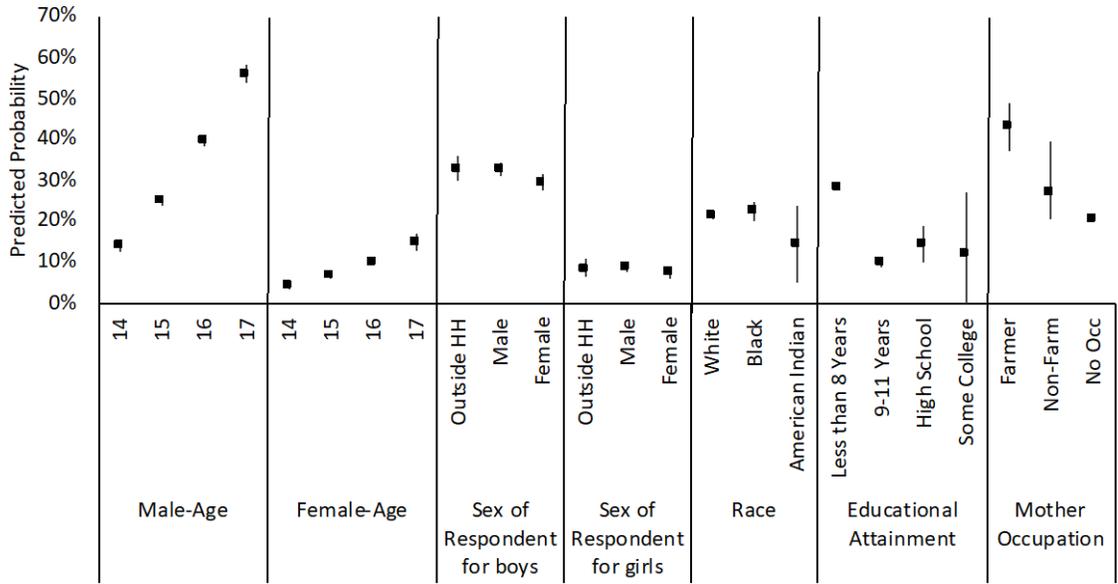
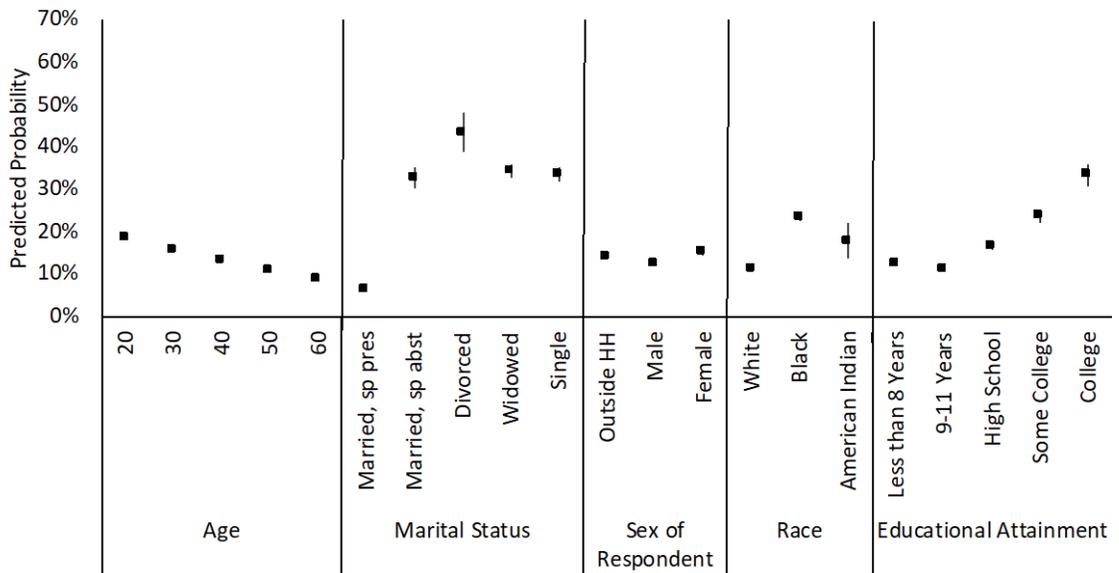


Figure 3-21: Occupational Response Predicted Probabilities for Selected Variables for Farm Women, 1940



occupation compared to those with a high school degree having a 16.6% chance. The sex of the respondent impacted occupational response rates, with 14.8% and 15.6% chance of respondents outside of the household female household respondents respectively returning an occupation for women compared to 12.6% of male household respondents.

CONCLUSION

Nancy Folbre and Margo Anderson discuss the limitations of how the Census collected occupational responses, specifically focusing on how gendered ideologies pushed the Census to underreport labor from women.⁶³ I show that biases such as the month of enumeration and the sex of the respondent had little impact on occupational reporting, but enumerator bias had larger effects, specifically for boys. Furthermore, typical socio-demographic characteristics such as age, gender, sibling order, school attendance, educational attainment, family wealth, immigrant generational status, parental occupations, and marital status all affected occupational responses for women and children. Sex, age, school attendance, and the mother's occupation tended to have the largest effects on occupational reporting for children. Older boys not attending school were more likely to return an occupation than younger boys and girls of all ages. Younger women who were unmarried were most likely to return an occupation for adult women which coincides with the literature.⁶⁴

Given the traditional Jeffersonian agricultural narrative, even when accounting for socio-demographic characteristics, inherent biases in Census enumeration led to vast undercounts of agricultural labor. Top-down biases by Census officials about what types

⁶³ Folbre (1991), 481-482. Anderson (1992), 31-32.

⁶⁴ Smuts (1960), 74. Evan Roberts, "Her Real Sphere? Married Women's Labor Force Participation in the United States, 1860-1940" (Dissertation: University of Minnesota, 2007): 1.

of labor should be considered “gainful employment” and bottom-up biases of enumerators interpreting instructions differently led to diverging occupational responses for boys, and to a lesser extent, girls, with low rates of adult women reporting an occupation. One method worth investigating is spatial modelling, considering spatial variation of enumerator biases. While the Census adjusted occupation collection to better fit their concerns with the urbanization and industrialization classification of work of the United States, this led to an inaccurate picture of agricultural work. Given the diaries of men, women, and children on farms, we know that most, if not all, people living on farms labored in some regard.⁶⁵ Further, the Census actively did not collect information around “keeping house”, which formed a fundamental part of agricultural work by women and children. A history of agriculture needs to go beyond taking the occupational responses at face value but considering hidden histories of women and children.

⁶⁵ Jones (2001), 2-6, Riney-Kehrberg (2011), 4-6. Craig (1993), 80.

Chapter 4: Brother Bought Himself a Farm Nearby: The Decline of Kin Propinquity in the United States, 1790-1940

Historians accept that agricultural families often settled near other family members in the long nineteenth-century.¹ Furthermore, nationally representative survey results in the mid-20th century found around 40% of elderly persons living 10 minutes or less from children.² While these distances to the nearest child for the elderly did not change between 1962 and 1988, we do not have a good grasp of precisely how many individuals lived near family at a national scale in the nineteenth and early twentieth-centuries other than an estimate for 1790 and 1900³. With the emergence of new complete count census data from IPUMS, we can measure some potential surname links between families for the entire United States over 150 years.

While this method of surname linking has some disadvantages and does not fully answer the question of the extent of nearby kin, it does showcase the changing living arrangements of nearby kin over multiple generations. A clear life course pattern in the data, a consistent decline associated with urbanization and the decline of agriculture, and

¹ Jon Gjerde, *From Peasants to Farmers: The Migration from Balestrand, Norway to the Upper Middle West*, (Cambridge: Cambridge University Press, 1985). D. Aidan McQuillan, *Prevailing over Time: Ethnic Adjustment on the Kansas Prairies, 1875-1925*, (Lincoln: University of Nebraska Press 1990). R.C. Ostergren, *A Community Transplanted: The TransAtlantic Experience of a Swedish Immigrant Settlement in the Upper Middle West, 1835-1915*, (Madison: University of Wisconsin Press 1998). Richard Wall, "Economic Collaboration of Family Members Within and Beyond Households in English Society, 1600-2000," *Continuity and Change*, 25:1 (2010), 83-108.

² Ethel Shanas, "Living Arrangements of Older People in the United States," *The Gerontologist*, 1:1 (1961), 29. Ethel Shanas, "Help Patterns and Social Class in Three Countries," *Journal of Marriage and Family*, 29:2 (1967), 262-264. Ethel Shanas, "Family-Kin Networks and Aging in Cross-Cultural Perspective," *Journal of Marriage and Family*, 35:3 (1973), 508. Geoffrey K. Leigh, "Kinship Interaction over the Family Life Span," *Journal of Marriage and Family*, 44:1 (1982), 203-204. Eileen M. Crimmins, & Dominique G. Ingegneri, "Interaction and living Arrangements of Older Parents and Their Children: Past Trends, Present Determinants, Future Implications," *Research on Aging*, 12:1 (1990), 6-8. Douglas A. Wolf, "The Elderly and Their Kin: Patterns of Availability and Access," in *Demography of Aging*, ed, L.G. Martin, & S.H. Preston (Washington, D.C.: National Academy Press, 1994), 182-186. Ge Lin, & Peter A. Rogerson, "Elderly Parents and the Geographic Availability of Their Adult Children," *Research on Aging*, 17:3 (1995), 315-320.

³ Daniel Scott Smith, "'All in Some Degree Related to Each Other': A Demographic and Comparative Resolution of the Anomaly of New England Kinship," *The American Historical Review*, 94:1 (1989), 68.

regional rates that reflected differing economic and demographic conditions substantiates the overall method. I conclude with a few remarks on the implications of the results.

Kinship consists of socially significant ties between individuals. These ties are most commonly relationships among family members. Familial kinship can be further divided between consanguineous kinship (blood ties) and affinal kinship (in-laws). For consanguineous kin, the household of procreation represents parents and the household of orientation represents an individual's nuclear family (spouse and children). Additional extended kin such as siblings, grandparents, etc. can live in the household of orientation of the individual under study or in their own household of orientation.⁴ Kinship can also be separated based on the importance and frequency of interaction between kin. Second cousins who see one another once every 5 years would be an example of familiar kin. Alternatively, effective kin have increased interaction with one another and ties tend to be more socially significant, such as a parent, sibling, spouse, or child. While geographic proximity is not the primary determinant of effective kin, propinquitous kinship can be an indicator of effective kinship, especially in the case of next door propinquity.⁵

Theorists from the 1930s and 1940s were concerned with extended kin networks in urban areas. An emphasis on neolocal separate nuclear households suggested that most families were not attached to extended kin networks.⁶ Litwak argued that extended kin connections via the family of procreation, the family of orientation, and affinal families is

⁴ Talcott Parsons, "The Kinship System of the Contemporary United States," *American Anthropologist*, 45:1 (1943), 23-26. Eugene Litwak, "Extended Kin Relations in an Industrial Democratic Society," in *Social Structure and the Family: Generational Relations*, ed. Ethel Shanas, & Gordon F. Streib (Englewood Cliffs: Prentice-Hall Inc., 1965), 290-291. Charles Wetherell, et al., "Social Networks, Kinship, and Community in Eastern Europe," *The Journal of Interdisciplinary History*, 24:4 (1994), 643. Hilde Bras, & Theo van Tilburg, "Kinship and Social Networks: A Regional Analysis of Sibling Relations in Twentieth-Century Netherlands," *Journal of Family History*, 32:3 (2007), 298-300.

⁵ Leigh (1982), 205. Carolyn Earle Billingsley, *Communities of Kinship: Antebellum Families and the Settlement of the Cotton Frontier*, (Athens: University of Georgia Press, 2004), 23.

⁶ Parsons (1943): 22.

higher than previously thought. In fact, these modified kin networks persisted through the 1950s and were not antithetical towards urbanization, geographic mobility, and occupational mobility.⁷

When looking at the types of aid or contact between these families, the survey evidence suggests families were not separated but often very closely connected, regardless of propinquity. Sussman's survey of Cleveland families in 1956 shows most families received help from related kin (help during illness, financial aid, care of children, personal advice, business advice, and valuable gifts). Based on reciprocity, most intergenerational assistance went from older generations to younger generations. These surveys were not nationally representative, which limits how we can interpret these surveys beyond their respective urban populations and time frame.⁸

Surveys from the mid to late 20th century were used to analyze the impact of kin, particularly children, on elderly behavior and interaction. The National Surveys of the Aged in 1962 and 1975⁹, the National Health Interview Supplement on Aging in 1984¹⁰ and the 1987 National Survey of Families and Households¹¹ suggest a kin proximity rate of around 40% with little to no change during this time period. The units of proximity vary by distance in miles compared to time of travel in minutes, but the surveys primarily utilize small measures of 1 mile to less than 10 minutes. Spring et al. shows 32% of the observed person periods in the Panel Study of Income Dynamics (PSID) had nuclear or extended kin

⁷ Eugene Litwak, "Geographic Mobility and Extended Family Cohesion," *American Sociological Review*, 25:3 (1960), 394.

⁸ Marvin B. Sussman, "The Help Pattern in the Middle Class Family," *American Sociological Review*, 18:1 (1953), 27-28. Marvin B. Sussman, "The Isolated Nuclear Family: Fact or Fiction?" *Social Problems*, 6:4 (1959), 339. Marvin B. Sussman, "Relationships of Adult Children with Their Parents in the United States," in *Social Structure and the Family: Generational Relations*, ed. Ethel Shanas, & Gordon F. Streib (Englewood Cliffs: Prentice-Hall Inc., 1965), 63.

⁹ Shanas (1961), 27-29. Shanas (1967), 257-266. Shanas (1973), 505-511.

¹⁰ Crimmins & Ingegneri (1990), 3-35.

¹¹ Wolf (1994), 146-194. Lin & Rogerson (1995), 303-331.

living within 1 mile between 1980 and 2013.¹² Beyond these sporadic findings since 1960, no long-run trend information on the changes in kin proximity exists for the United States.

The emergence of U.S. quantitative social history in the 1960s led to the creation of some of the first historical datasets. These datasets were often contained complete coverage of a small geographic area over a period of time or at specific moments. These histories focused on the social histories of “common people” which included extended kin networks, especially when data such as marriage, birth, death, and church records recorded family relationships. While detailed studies of how kin were utilized within a locality provide great context for local networks, the results cannot be extrapolated to a larger geographic scale or over time.¹³

Ditz’s study of Connecticut and Billingsley’s study of Arkansas are two examples of detailed studies of kin. Using a variety of sources from local tax and probate records to the U.S. Census and genealogical history, Ditz and Billingsley both articulate the role that kinship played in individual relationships as well as inheritance. Billingsley in particular creates a framework for how to apply kin methodologically using anthropological theory and genealogical methods to describe kinship. Most effective kinship was based on intergenerational relationships in these studies.¹⁴

Intergenerational coresidence of the elderly and living arrangements coincide with kin beyond the household. Elderly persons prior to 1940 commonly lived with adult

¹² Sandra L. Hofferth, & John Iceland, “Social Capital in Rural and Urban Communities,” *Rural Sociology*, 63:4 (1998), 585. Amy Spring, et al., “Influence of Proximity to Kin on Residential Mobility and Destination of Choice: Examining Local Movers in Metropolitan Areas,” *Demography*, 54:4 (2017), 1284.

¹³ Merle Curti, *The Making of an American Community: A Case Study of Democracy in a Frontier County*, (Stanford: Stanford University Press, 1959). Gjerde (1985). Toby L. Ditz, *Property and Kinship: Inheritance in Early Connecticut, 1750-1820*, (Princeton: Princeton University Press, 1986). Robert C. Kenzer, *Kinship and Neighborhood in a Southern Community: Orange County, North Carolina, 1849-1881*, (Knoxville: University of Tennessee, 1987).

¹⁴ Ditz (1986), 105. Billingsley (2004), 41.

children. While declining between 1850 and 1940, the majority of elderly persons lived with an adult child during this time period. Previous literature argued that this served as a form of old age security for the elderly before social security.¹⁵ More recently, Ruggles argues that most heads of household tended to be elderly parents rather than the children. Since the title “head of household” can indicate the power relations within families, this suggests that children were living with elderly parents rather than the other way around. Additionally, these families were better off economically, suggesting that intergenerational coresidence prior to 1940 was not economically need based for most elderly persons. Ruggles suggests inheritance practices and a lack of outside economic opportunities for younger generations contributed to high intergenerational coresidence. With the rise of industrial labor, children had better wage opportunities elsewhere and slowly abandoned the intergenerational household through and beyond World War II.¹⁶

If intergenerational coresidence indicated inheritance practices and lack of economic opportunities elsewhere, children living near parents also reflected inheritance practices focused less on intergenerational accumulation and more on establishing as many surviving children and their families as possible within the community. Historically, this common form of inheritance was practiced in New England and among “German” families in the Midwest.¹⁷ Comparing rates of local kin that could potentially be children with

¹⁵ Wilbur J. Cohen, et al., “Social Security Act Amendments of 1954: A Summary and Legislative History,” *Social Security Bulletin*, 17:9 (1954), 3. Peter Laslett, *The World We Have Lost*, (London: Methuen, 1965). Tamara K. Hareven, “Aging and Generational Relations: A Historical and Life Course Perspective,” *Annual Review of Sociology*, 20: (1994), 438. Steven Ruggles, “Patriarchy, Power, and Pay: The Transformation of American Families, 1800-2015,” *Demography*, 52:6 (2015), 1798.

¹⁶ Steven Ruggles, “The Decline of Intergenerational Coresidence in the United States, 1850 to 2000,” *American Sociological Review*, 72:6 (2007), 965. Brian Gratton, & Myron P. Gutmann, “Emptying the Nest: Older Men in the United States, 1880-2000,” *Population and Development Review*, 36:2 (2010), 339-342.

¹⁷ Ditz (1985), 49-50. Jon Gjerde, *The Minds of the West: Ethnocultural Evolution in the Rural Middle West, 1830-1917*, (Chapel Hill: University of North Carolina Press, 1997), 159-160.

intergenerational coresidence and the ages of those children could describe quantitatively how inheritance practices changed or differed across the United States historically. While genealogical studies provide an in-depth analysis of kinship and community studies provide data for an entire community, these approaches cannot provide consistent representative information on long-run trends in kin propinquity.

Families strategically utilized kinship by individuals for property devolution, marital alliances, hierarchical enforcement of social mores, and reciprocal labor. High rates of propinquitous kin suggest families with stronger kin, social, and labor networks. Common family composition measures such as intergenerational coresidence require only within household measures because of data availability and restraints. Inheritance represents the power structure between generations, and measures of propinquitous kin can provide insight into intergenerational relations during a period of significant changes for generational negotiation.¹⁸ With the advent of complete-count census data, basic measures of kin propinquity on a national scale are now feasible.

The release of the Integrated Public Use Microdata Series (IPUMS) census microdata samples in 1993 allowed consistent long-run analysis of national changes in family and household composition.¹⁹ While IPUMS provides a powerful way to analyze population at the national level since 1850, the sample design made it difficult to study kinship. IPUMS produced the first complete census count dataset with the 1880 Census in 2003. Since 2014, IPUMS has released complete count data for most census years (1790-1940)²⁰. The

¹⁸ Yvonne Pitts, *Family, Law, and Inheritance in America: A Social and Legal History of Nineteenth-Century Kentucky*, (Cambridge: Cambridge University Press, 2013), 135, 181.

¹⁹ Steven Ruggles, "The Origins of African-American Family Structure," *American Sociological Review*, 59:1 (1994), 136.

²⁰ The 1890 Census was destroyed in a fire in 1919 and is not available. Kellee Blake, "'First in the Path of the Firemen': The Fate of the 1890 Population Census, Part 1," *Prologue Magazine*, 28:1 (1996).

restricted version of the database includes full information on names, allowing simple measures of kin propinquity.²¹ Enumerators ordinarily went door to door to collect information, so most individuals and households are enumerated sequentially. This sequential ordering allows us to find consistent estimates of the extent to which same-surname kin lived near one other.

Using restricted complete count Census data and NHGIS county boundary files from IPUMS, I measure the spatial structure of potentially proximate kin using an egocentric surname matching approach.²² This approach is similar to propinquity methods used by Grigoryeva and Ruef, and Logan and Parman to measure racial segregation.²³ Due to changing surnames after marriage for women, we can only capture links on the male side of the family for ever-married women. For never-married women, links on the female side can be captured, but with low numbers of never-married women during this time period, kin propinquity links are significantly understated for women.²⁴ Finally unless stated otherwise, common surnames have been removed.²⁵

The distance threshold for this method represents the number of households we search for the same surnames. For example, a distance threshold of 3 means we match surnames in the three households before the household of orientation and the three

²¹ Minnesota Population Center, & Ancestry.com, *IPUMS Restricted Complete Count Data: Version 1.0* [Machine readable database], (Minneapolis: University of Minnesota, 2013). Minnesota Population Center, *North Atlantic Population Project: Complete count microdata Version 2.2*, [machine readable database], Minneapolis: Minnesota Population Center, 2015).

²² Minnesota Population Center & Ancestry.com (2013). Steven. Ruggles, et al., *Integrated Public Use Microdata Series: Version 7.0* [dataset], (Minneapolis: University of Minnesota, 2017). Steve Manson, et al., *IPUMS National Historical Geographic Information System: Version 12.0* [Database], (Minneapolis: University of Minnesota. 2017).

²³ Angelina Grigoryeva, & Martin Ruef, "The Historical Demography of Racial Segregation," *American Sociological Review*, 80:4 (2015), 820. Trevon Logan, & John M. Parman, "The National Rise in Residential Segregation," *Journal of Economic History*, 77:1 (2017), 135-138.

²⁴ Steven Ruggles, "Marriage, Family Systems, and Economic Opportunity in the United States Since 1850," in *Gender and Couple Relationships*, ed. S.M. McHale, J. Van Hook, V. King, & A. Booth, (Heidelberg: Springer. 2016): 3-8.

²⁵ For a more detailed description of how common surnames were removed, please consult Appendix B.

households after the household of orientation. A lower distance threshold means we capture fewer links, but we reduce the likelihood of a false positive match. People who share the same surname within the same general vicinity are generally concentrated in close proximity to one another. In 1900, the kin propinquity rate was 9.3% within 3 households (11.7% when not removing common surnames). Using distance thresholds of 50, we get kin propinquity rates of 12.5% (29.8% when not removing common surnames). Another way to think about this is what percentage of the links are made in the first three households when using large distance thresholds. With a distance threshold of 50, 74% of the links are made in the first three households (39% when not removing common surnames). This pattern is consistent in all of the census years analyzed. Furthermore, the overall kin propinquity trends are similar regardless of the distance threshold used. The higher thresholds capture more kin, but likely include a significant number of matches that are not actual kin where the surname match is coincidental. To minimize this problem, this chapter focuses on a 3- household distance threshold.

I also limit my analysis to kin who reside in the same enumeration districts. Because enumerators went from house to house, proximity on the enumeration form correlates with geographic proximity, but the association is imperfect. Enumerator paths were not consistent within census years, nor consistent across decades.²⁶ Because of this, neighbors in one census may not be neighbors in the next. Some analysts use plat maps or property records to identify exact spatial location in historical communities, but the necessary sources are only sporadically available before the late nineteenth century, and geocoding

²⁶ Kenzer (1987), 155-160. F.L. Owsley, *Plain Folk of the Old South*, (Baton Rouge: Louisiana State University, 1949).

locations for the entire country extremely expensive.²⁷ Focusing on households with a distance threshold of 3 or less minimizes the potential impact of variations in the enumerators' routes. This measure of kin propinquity captures only a subset of kin relations. Parents-in-law, married daughters or sisters, and any other kin affected by women changing names upon marriage are systematically excluded. Accordingly, this analysis focuses mainly on patrilineal kinship, and the trends and differentials may differ for kin types that are excluded.

I employ two methods of linking. Both methods require the surnames of households within 3 dwellings in either direction of the Census to match, and the race of the two surnames must also match.²⁸ Prior to 1850, we only have names for heads of household rather than all individuals in the household. The first method matches heads of household. The second method links all non-institutional individuals within three households in either direction. I compare the two methods to determine if rates differed dramatically based on the method and also to create a long run time series between 1790 and 1940. The pre-1850 census data contains several data quality issues. Enumerator accuracy was probably low, as there were minimal hiring standards and virtually no training of the Assistant Marshalls who collected the data.²⁹

²⁷ John Clarke, "Social Integration on the Upper Canadian Frontier: Elements of Community in Essex County 1790-1850," *Journal of Historical Geography*, 17:4 (1991), 395.

²⁸ For this version, mulattos were matched to blacks. The universe at risk would typically exclude the first and last three households in an enumeration district since they do not have the same risk of potentially propinquitous kin as other households. The results however did not change when removing these cases from analysis. Race of the head of household is not enumerated prior to 1850.

²⁹ Diana L. Magnuson, *The Making of a Modern Census: The United States Census Population, 1790-1940*, (Dissertation, University of Minnesota, 1995), 7, 155. Data quality concerns around missing data, alphabetized data, and common surnames are discussed in depth in Appendix B.

Figure 4-1: Propinquitous Kinship Percentage by Method, 1790-1940

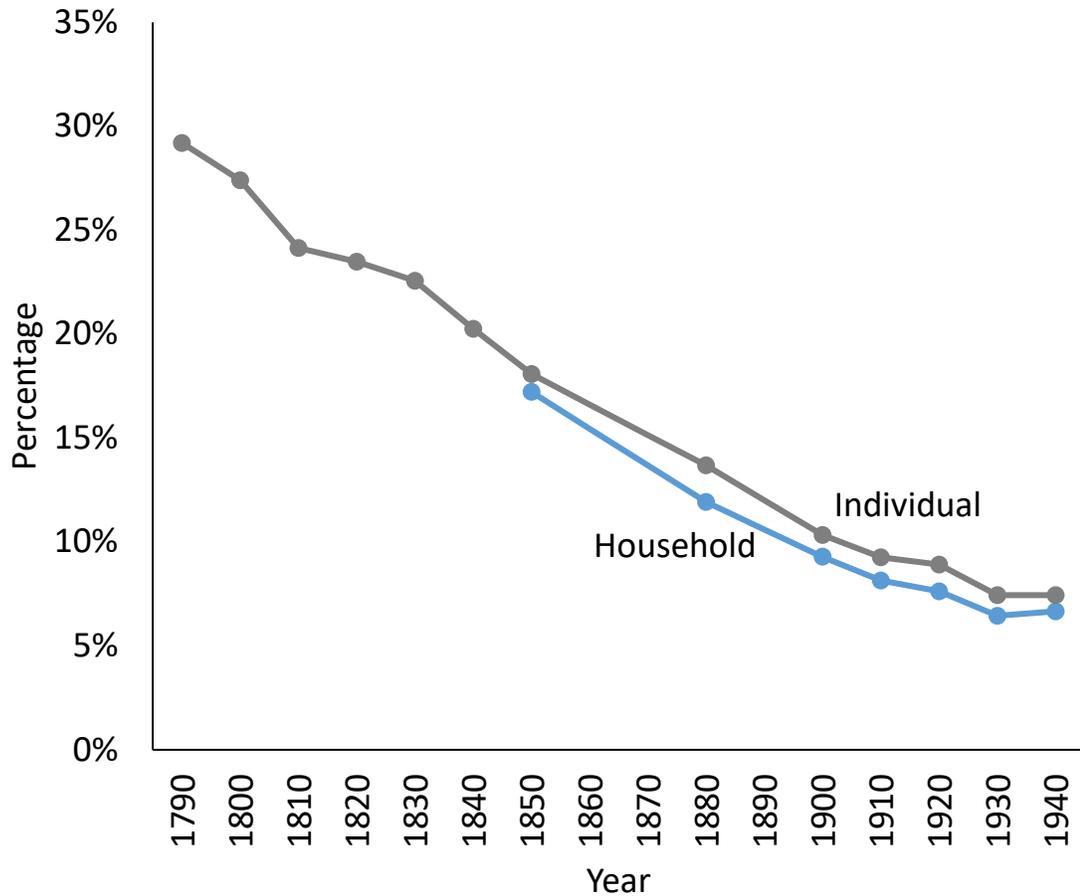


Figure 4-1 compares the rates of linkage between heads of household and individual-level kinship linking. The percentage of household heads with propinquitous kin listed in the census within three households declined from approximately 29% of households in 1790 to approximately 7% in 1940. Prior to 1850, only household heads had their surnames recorded. After 1850, all free persons had their surnames recorded. Figure 1 shows that the methodologies are roughly similar. Household kinship linking rates are slightly lower than individual level kinship linking rates. The national kin propinquity rate steadily declined 1 to 2 percentage points each decade. Between 1930 and 1940, the rates stabilized, possibly

due to the Great Depression. This closely mirrors the long run decline in intergenerational coresidence in the United States.³⁰

A typical life course propinquity pattern consisted of a “wave” as seen in Figure 4-2. In all census years, kinship peaks among persons aged 0-4, 20-24, and especially 55-80. This supports a multigenerational interpretation as the peaks occur at the periods of life when generational overlap is greatest. Very young children likely had living grandparents, young adults likely had living parents, and the elderly likely had children old enough to establish an independent household. The trend of high potential proximate kin for the elderly flattens substantially over time and largely disappears by 1940.

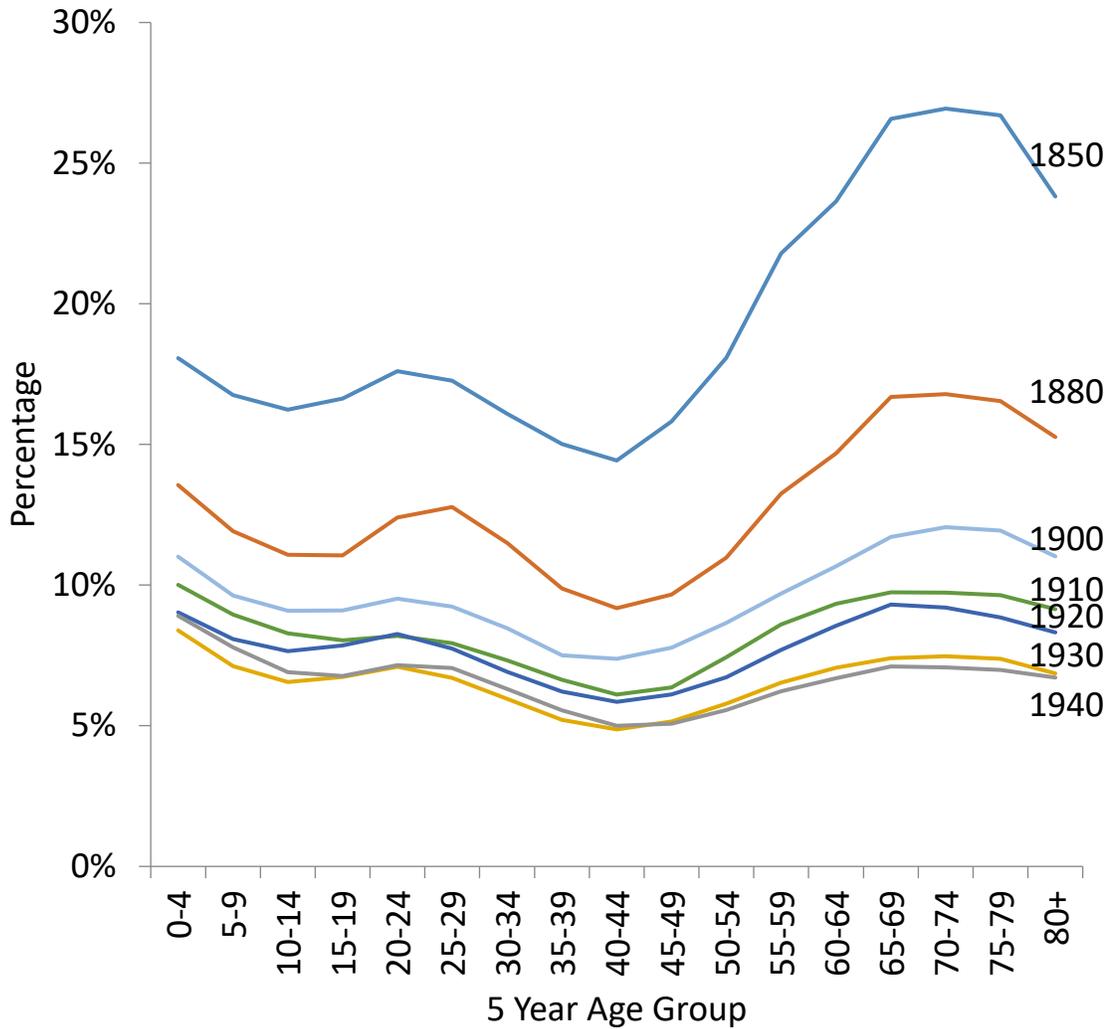
The differences between the ages of potential kin further reflect these trends. Figures 4-3 through 4-5 show these patterns for 20-24-year-old, 40-44-year-old, and 60-64-year-old persons. The graphs show the difference in age between the person in the specific age group and the age of the first person in the surname sequence they linked to.³¹ Ages to the right of the vertical line indicate the reference person the 20-24-year-old person linked to is older. At age 20-24, most persons linked with older siblings since the majority of the links occur with people less than 15 years older than the 20-24-year-old persons. A small spike for potential proximate kin in the 20-40 years older group indicate likely parents. Persons aged 40 to 44 showed a similar pattern, although the potential siblings are a combination of older and younger. Small spikes in potential children and potential parents for this age group existed. Finally, elderly persons between the age of 60 and 64 almost solely linked with individuals at least 20 years younger than they, indicating potential

³⁰ Ruggles (2007): 965.

³¹ The reference person is defined as the first related person in the surname sequence within a household. While it is typically the head of household, it is not required to be.

children. This further confirms the life course interpretation of the results as not only do the potential kin increase and decrease over the life course, but the potential proximate kin matched within age groups we expect to see from this interpretation.

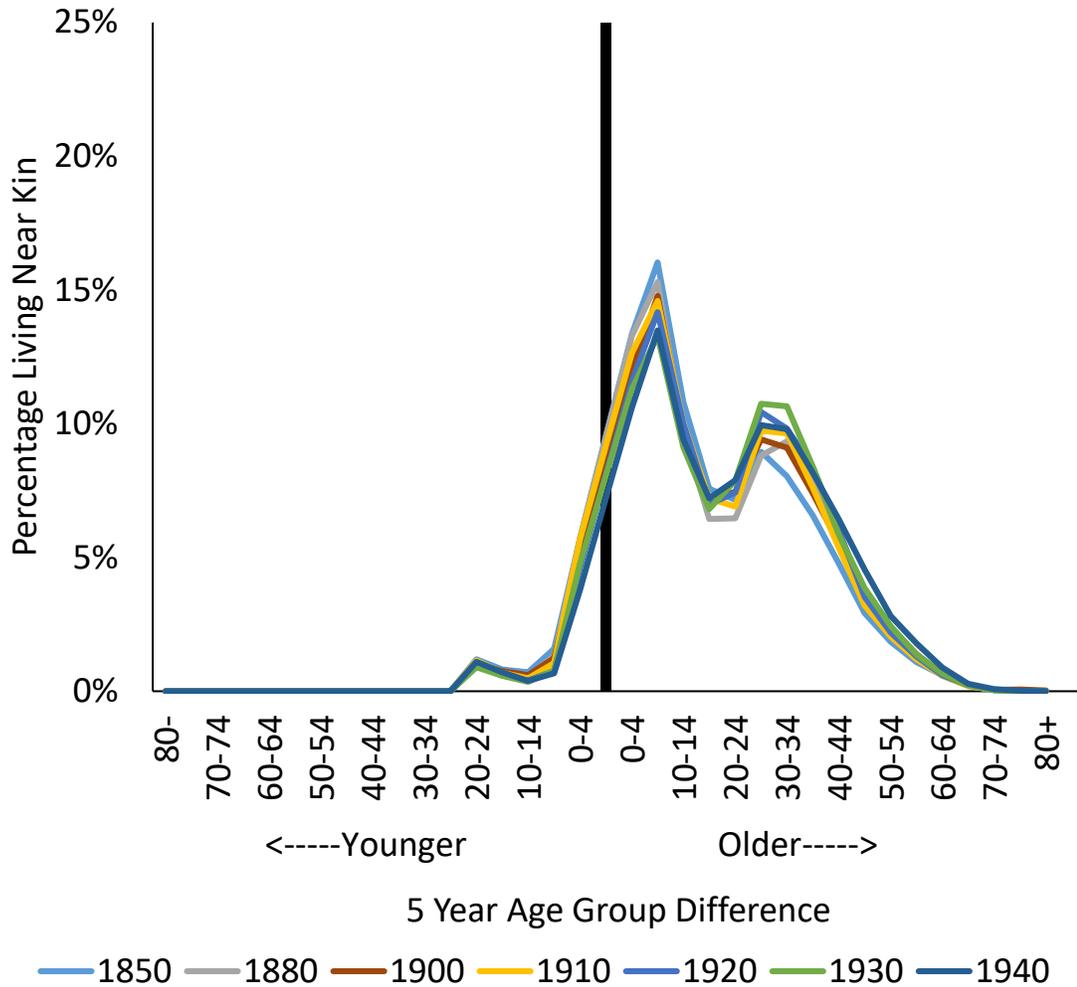
Figure 4-2: Propinquitous Kin by Age Group, 1850-1940



The distribution of age differences experienced largely consistent yet nuanced changes in Figures 4-3 through 4-5. In general, the percentage of older kin increased over time while the percentage of same-age or younger kin declined. This reflected the decline of fertility and mortality between 1850 and 1940, which reduced the availability of siblings and

children and increased the availability of parents.³²

Figure 4-3: Age Difference Between Nearby Kin and 20-24 Year Old Individuals, 1850-1940

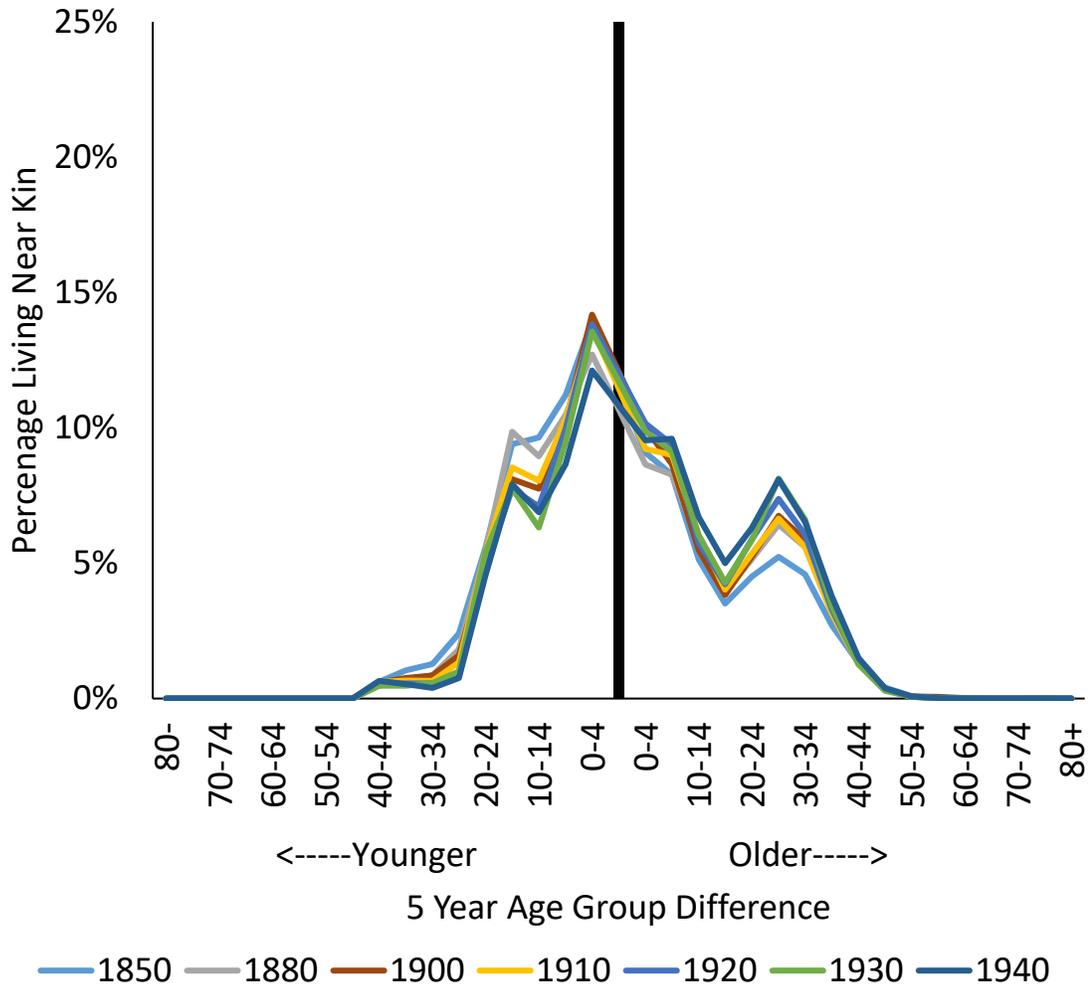


A breakdown of kin propinquity by immigrants, race, and urban/rural status in Table 4-1 shows several revealing patterns. For immigrants, first generation immigrants experienced far lower rates of kin propinquity when compared to second generation immigrants and people who had been in the U.S. for 3 or more generations. This reflected

³² J. David Hacker, & Evan Roberts, “The Impact of Kin Availability, Parental Religiosity, and Nativity on Fertility Differentials in the late 19th-century United States,” *Demographic Research*, 37:34 (2017), 1061, 1063-1064.

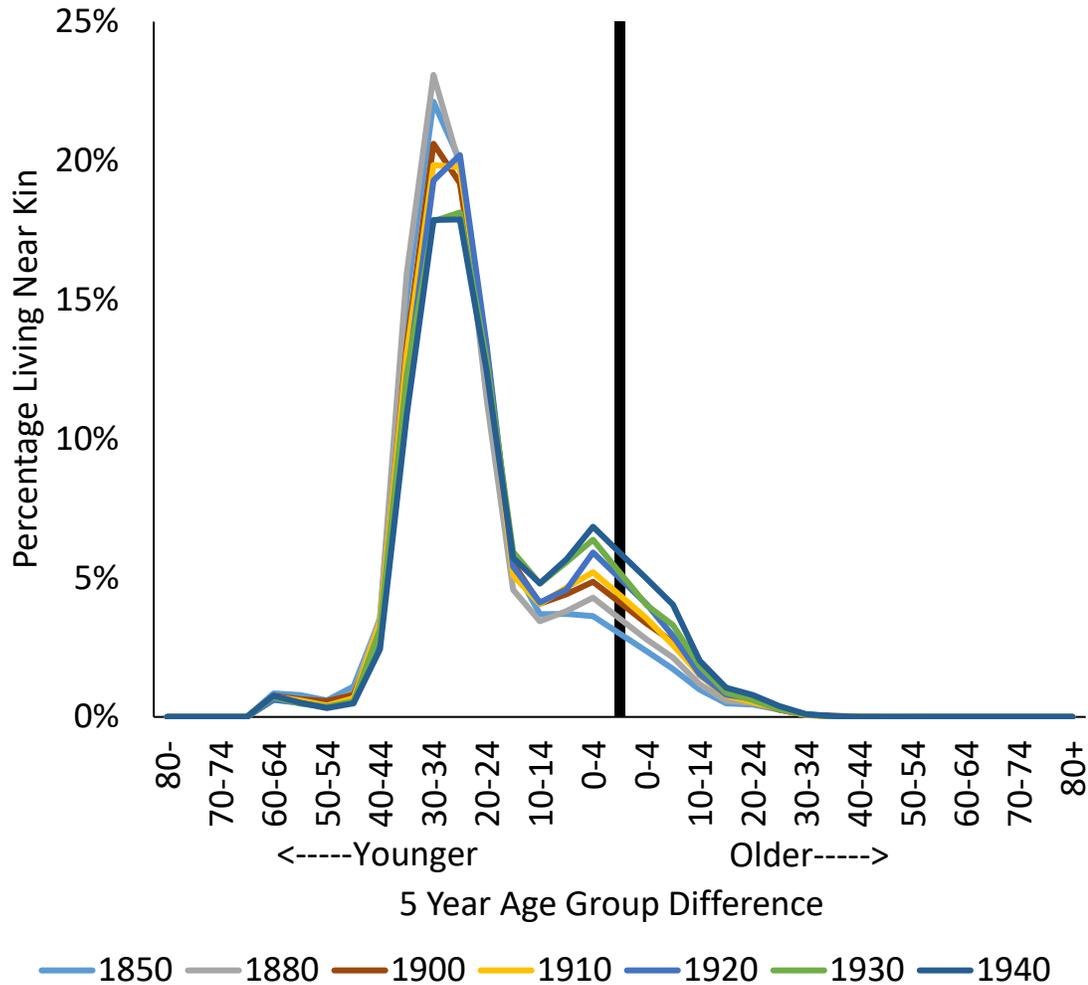
the availability of kin, since many immigrants in the nineteenth century had family members who did not migrate to the United States. All categories of immigrants/migrants and native-born individuals saw a decline in kin propinquity through this time period.

Figure 4-4: Age Difference Between Nearby Kin and 40-44 Year Old Individuals, 1850-1940



Variation in racial differences reflect patterns of household structure and possibly various U.S. policies. For blacks, in 1850, only the free black population can be analyzed

Figure 4-5: Age Difference Between Nearby Kin and 60-64 Year Old Individuals, 1850-1940



but starting in 1880, blacks, American Indians and Chinese persons have higher propinquity rates than whites nationally when excluding common surnames. While various policies played a role in this, such as segregation and Jim Crow laws, Indian Reservations, and the Chinese Exclusion Act of 1882, these demographic groups also have more complex

family structures than whites.³³ When controlling for common surnames however, only blacks exhibit higher kin propinquity rates than whites (Table 4-1).

Table 4-1: Kin Propinquity Rates by Immigration, Race, and Urban/Rural Status, 1850-1940

	1850	1880	1910	1940
First Generation Immigrant	6.8%	6.2%	4.1%	3.9%
U.S. Born	18.6%	13.0%	9.0%	7.0%
Second Generation Immigrant	-	7.1%	5.6%	-
Native-born	18.6%	15.0%	10.4%	7.0%
White	17.3%	11.8%	7.9%	6.6%
Black ¹	8.8%	13.0%	11.0%	8.5%
American Indian	-	2.4%	6.0%	6.4%
Chinese	-	-	2.3%	1.8%
Japanese	-	-	1.7%	2.5%
Rural	19.5%	15.2%	12.8%	11.4%
Farm	22.9%	17.8%	15.3%	15.2%
Nonfarm	13.6%	10.0%	8.1%	8.5%
Urban	7.4%	3.7%	3.2%	3.2%

Notes

¹Black population in 1850 only includes Free Black population.

Urban kin propinquity rates are much lower than rural rates. Measured in terms of spatial distance rather than distance on the enumeration form, it is likely that urban propinquity was higher because the distance threshold used here is smaller than used in studies from the 1960s.³⁴ Even with this methodological shortcoming, previous scholarship argues that kin ties in cities were weaker than in rural areas.³⁵ When decomposing urban and rural kinship as a single factor, the growth of urban population between 1850 and 1940 accounts for 38% of the decline in kin propinquity.³⁶ Farm families had the highest kin propinquity rates through this time period. Based on a life course interpretation, children

³³ Yoshinori Kamo, & Min Zhou, "Living Arrangements of Elderly Chinese and Japanese in the United States," *Journal of Marriage and Family*, 56:3 (1994), 544-545. Yoshinori Kamo, "Racial and Ethnic Differences in Extended Family Households," *Sociological Perspectives*, 4:2 (2000), 211-212. Ruggles (1994), 136.

³⁴ Litwak (1953), 27-28. Sussman (1959), 339. Sussman (1965), 63. Shanas (1961), 27-29. Shanas (1967), 257-266. Shanas (1973), 505-511.

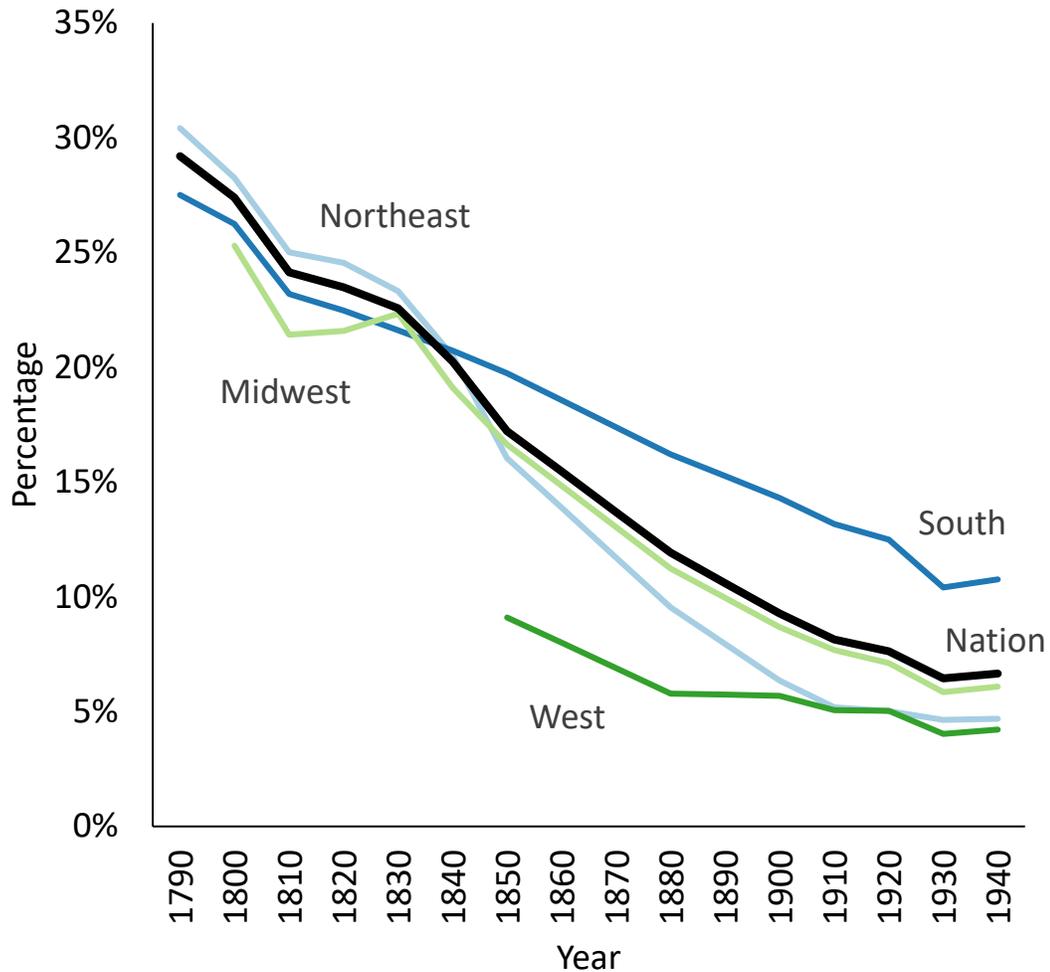
³⁵ Louis Wirth, "Urbanism as a Way of Life," *American Journal of Sociology*, 44:1 (1938), 20-21. Parsons (1943), 28-29. Hofferth & Iceland (1998), 574-575.

³⁶ Evelyn M. Kitagawa, "Components of a Difference Between Two Rates," *Journal of the American Statistical Association*, 50:272 (1955), 1168-1194. Prithwis Das Gupta, *Standardization and Decomposition of Rates: A User's Manual*, U.S. Bureau of the Census, Current Population Reports, Series P23-186. (Washington, D.C.: U.S. Government Printing Office, 1993).

lived near parents and/or siblings, and land availability played an important role in some of these children living near kin. If land was not available, then the children would either be required to continue living on their parent's farm, migrate elsewhere to find available land, or switch to a different occupation and migrate to the local town or large city for additional economic opportunities.

Regional differences in Figure 4-6 showcase the different economic and demographic circumstances very clearly. Prior to 1850, the Northeast had the highest rates of kin propinquity with 28.9% of individuals living nearby kin in 1790. The South had lower rates than the Northeast prior to 1850 but overtook the Northeast by 1850. Midwestern kin propinquity remained roughly even with the South until 1850 when the rates were more similar to the Northeast. The Midwest and South went through similar changes while the Northeast saw larger kin propinquity declines than other regions. This reflected growing urbanization in the Northeast with the population expansion of cities such as New York City, Boston, and Philadelphia. With the rise of large cities such as Chicago, St. Louis, and Cincinnati during the mid to late nineteenth-century, likely explains part of the changing trajectory of kin propinquity in the Midwest compared to the South.

Figure 4-6: Kin Propinquity by Region, 1790-1940



Kin propinquity rates in the West were the lowest of the three regions. In 1850, only 9% of persons lived near kin in the West, declining to 4% in 1940. Clustering in particular areas within regions shows more nuance than an overall regional measure in Figures 4-7 through 4-17 for 1790-1940 by decade. New England experienced higher kin propinquity than others areas prior to the 1840s. Other areas such as Appalachia, New Mexico, and Utah experienced higher rates of kin propinquity than other areas within their localities starting in the 1850s.

Figure 4-7: County Kin Propinquity Rate 1790

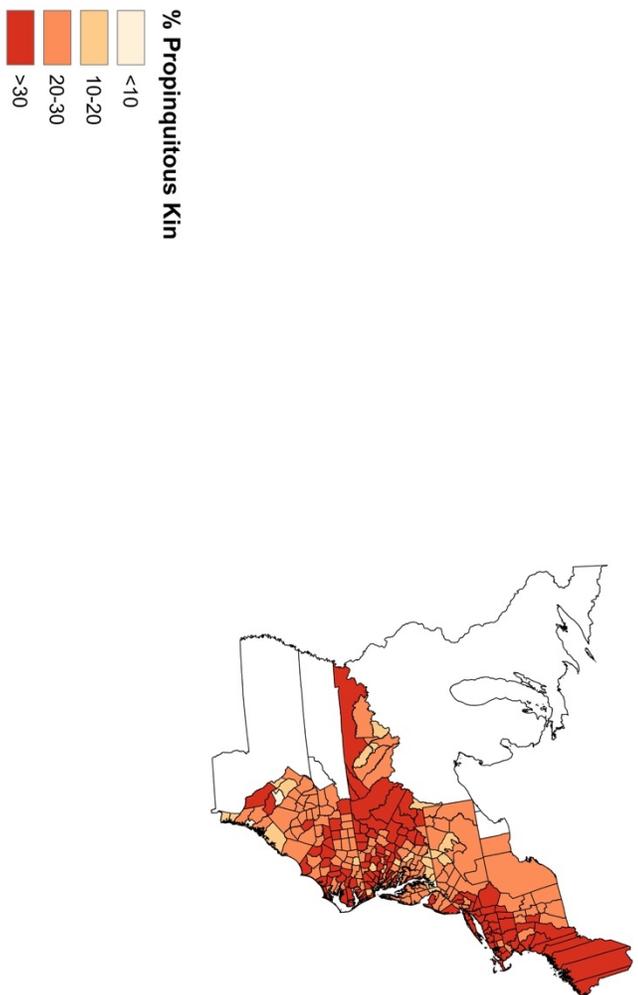


Figure 4-8: County Kin Propinquity Rate 1800

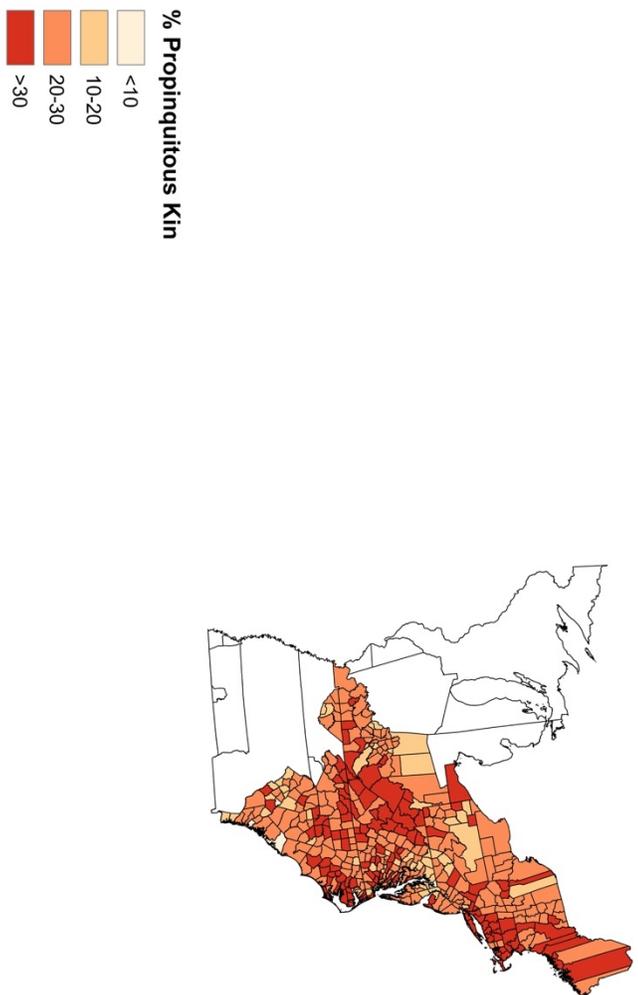


Figure 4-9: County Kin Propinquity Rate 1810

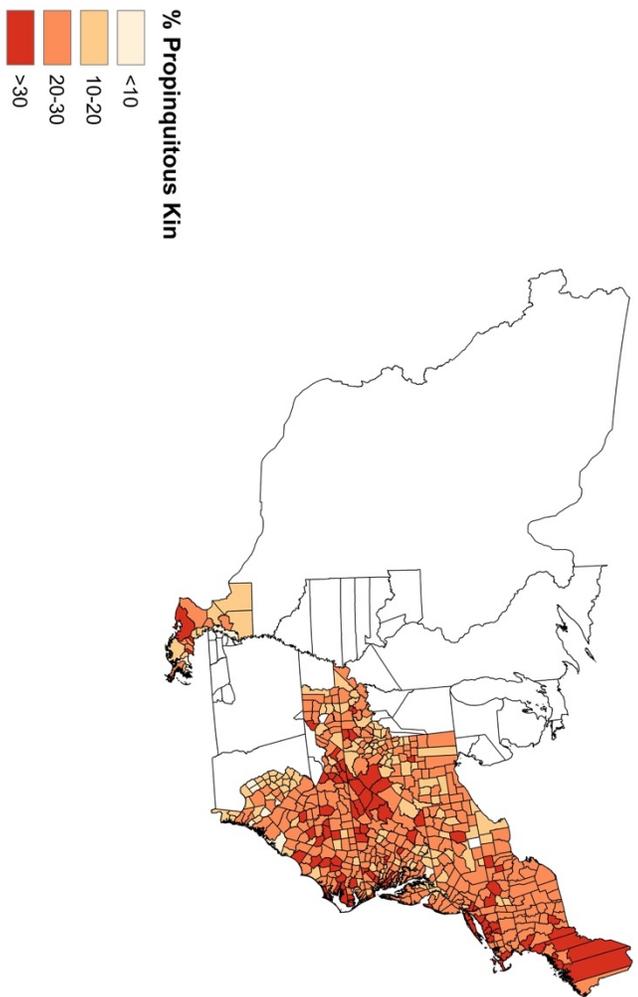


Figure 4-10: County Kin Propinquity Rate 1820

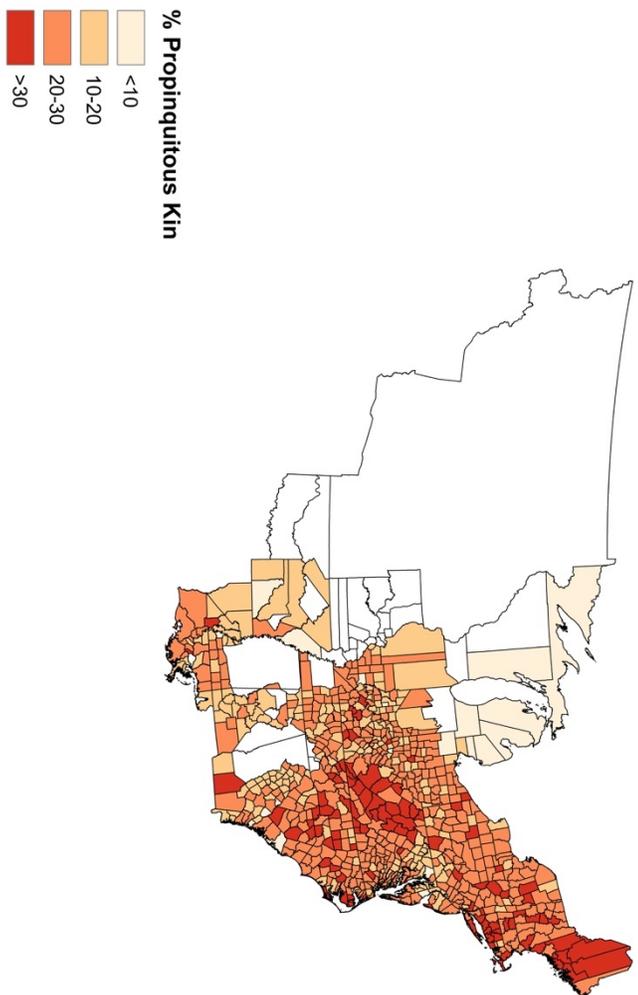


Figure 4-11: County Kin Propinquity Rate 1830

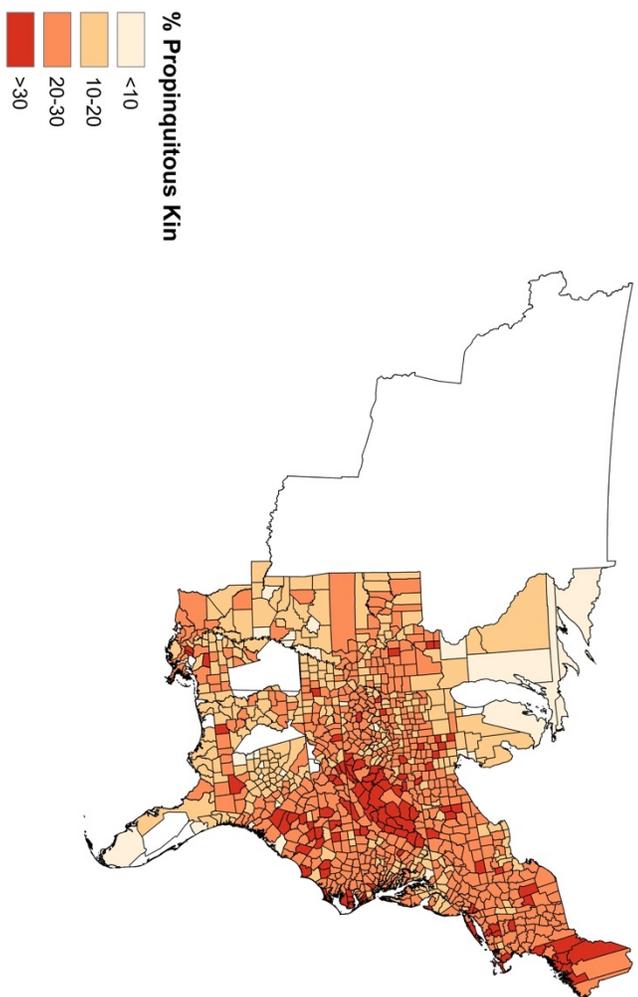


Figure 4-12: County Kin Propinquity Rate 1840

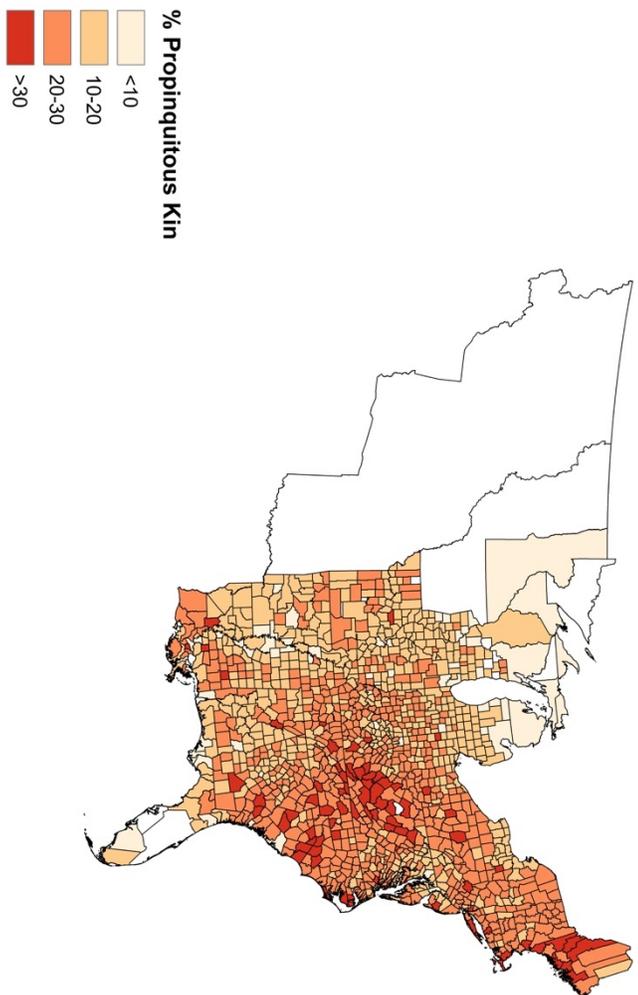


Figure 4-13: County Kin Propinquity Rate 1850

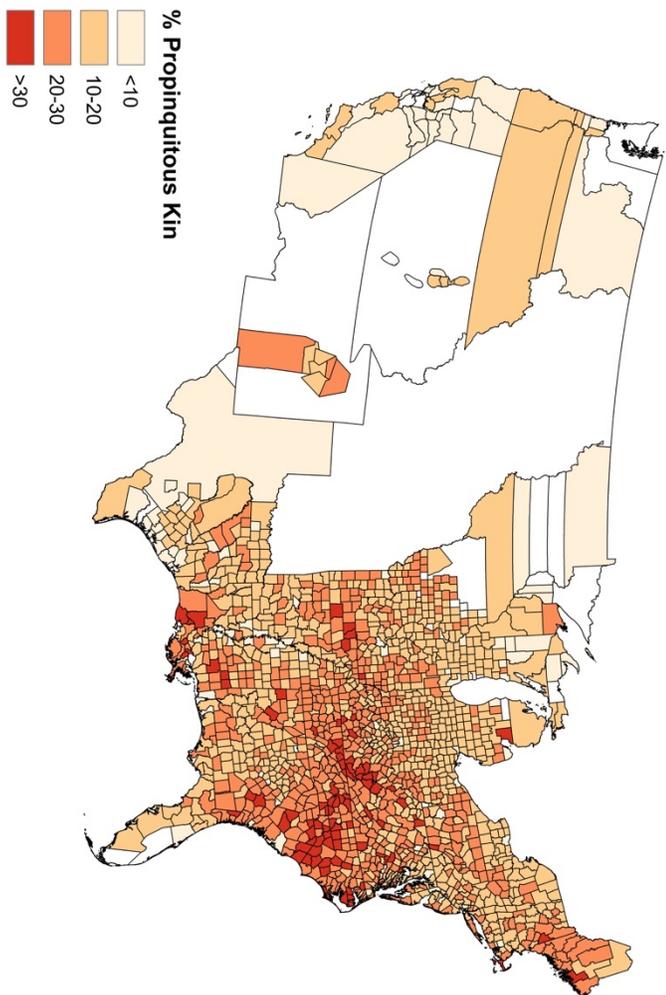


Figure 4-14: County Kin Propinquity Rate 1880

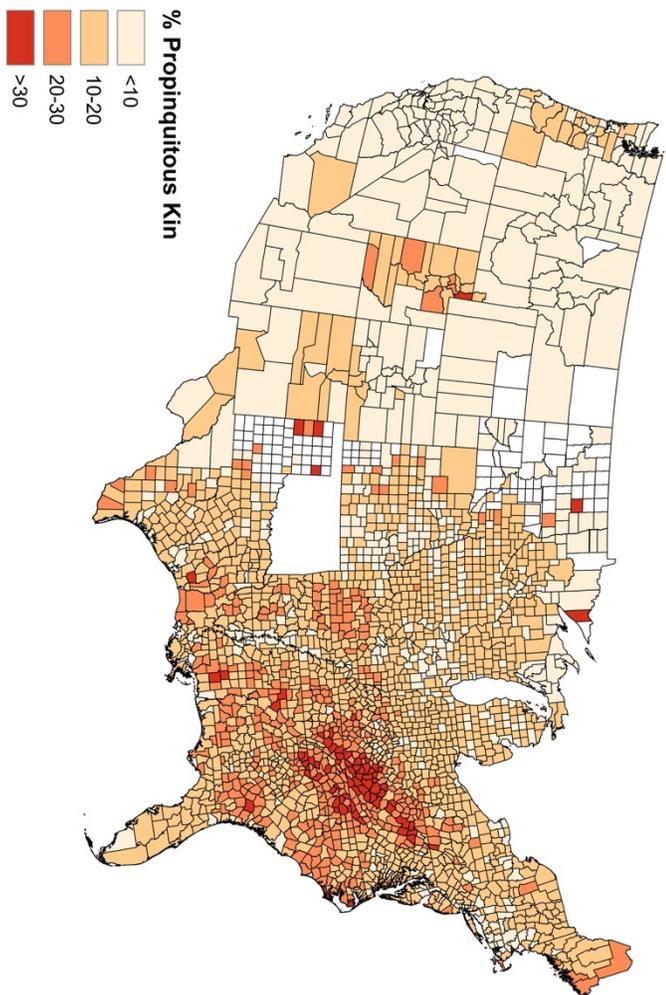


Figure 4-15: County Kin Propinquity Rate 1900

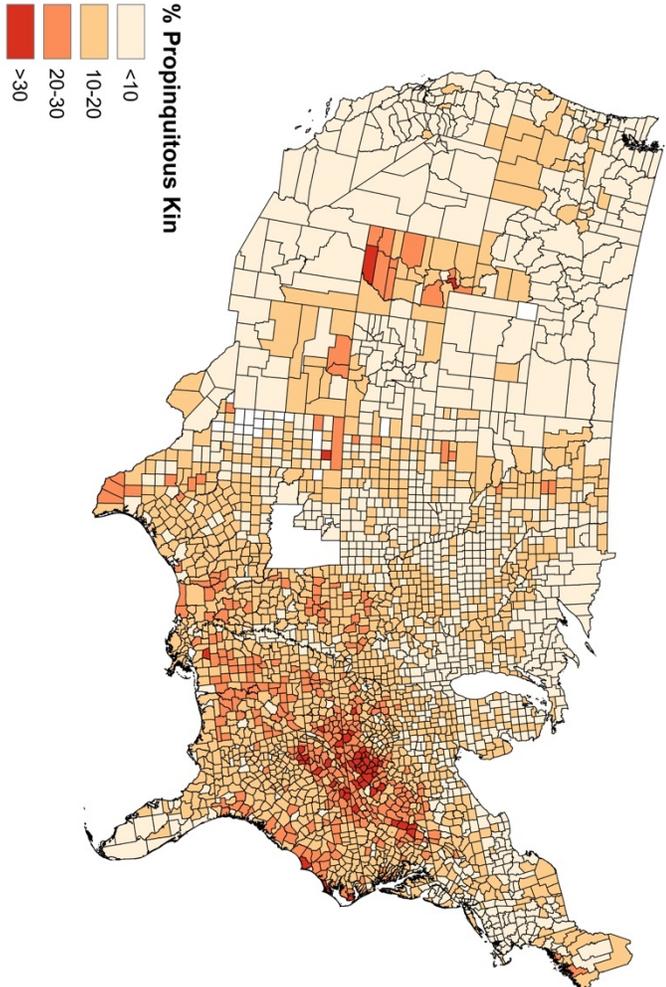


Figure 4-16: County Kin Propinquity Rate 1910

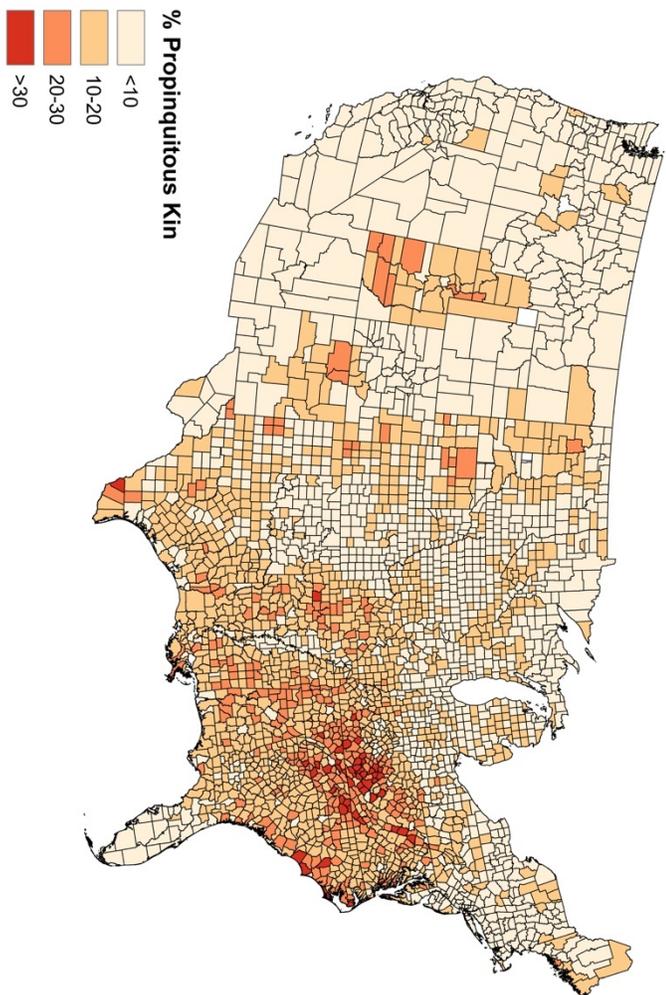


Figure 4-17: County Kin Propinquity Rate 1920

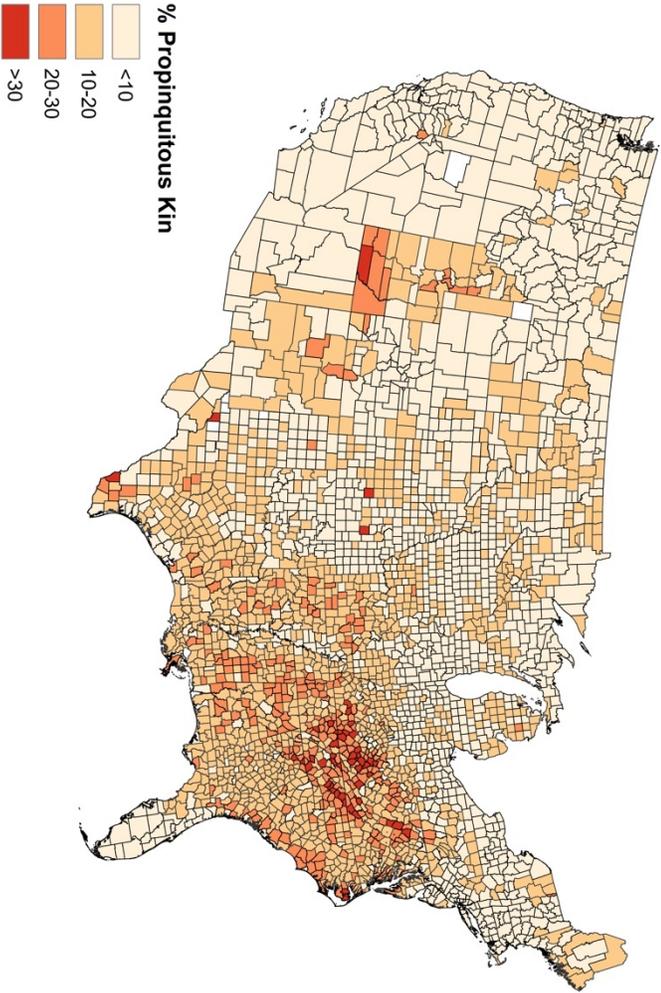


Figure 4-18: County Kin Propinquity Rate 1930

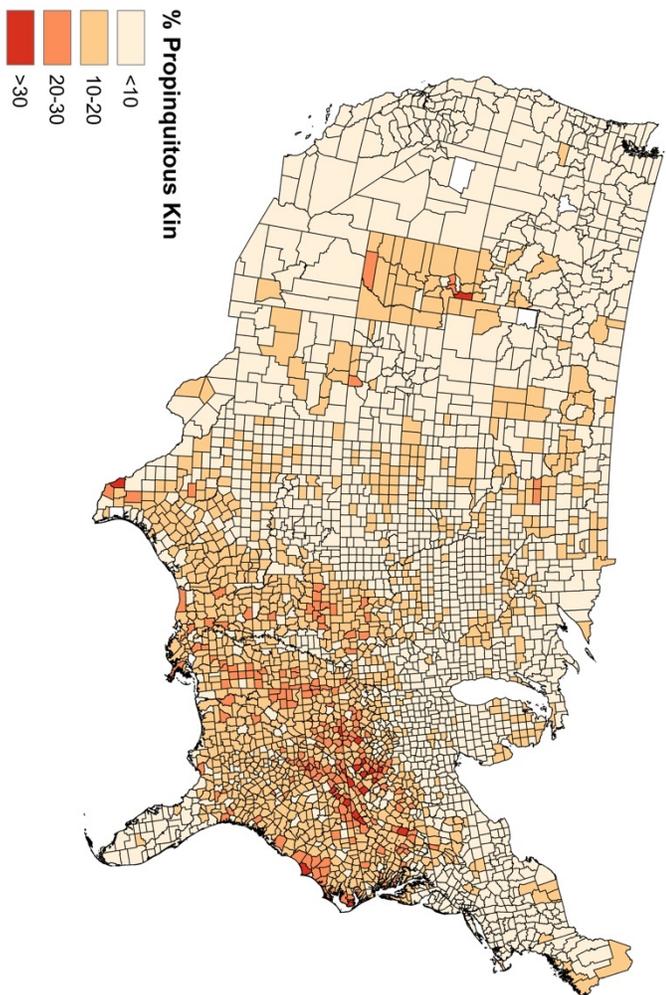
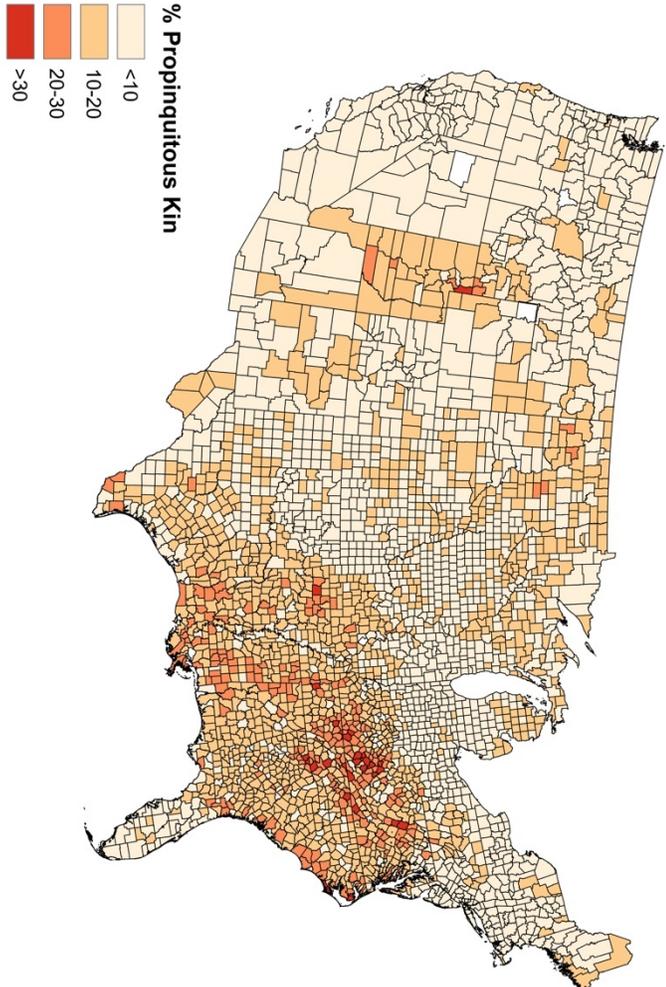


Figure 4-19: County Kin Propinquity Rate 1940



The Utah cluster in the 1880s was likely due to the high Church of Latter Day Saints population, and Appalachia represented an area with a unique familyist society.³⁷ While the general decline in kin propinquity can be seen in Figure 4-7, these high kin propinquity areas stand out amongst their respective regions.

The long-run decline in kin propinquity reflected the changing economic and demographic transformations the United States underwent between 1790 and 1940. These declines also were a vehicle for the intergenerational transmission of land, assets, and physical labor. Speculating on the effects of kin relations and emotional assistance aside, the long-run decline in kin propinquity lends credence to the long-run decline in the importance of kinship. Kin networks weakened nationally, and with few exceptions, declined regardless of socioeconomic background. The decline in kin propinquity closely mirrored other long-run trends such as the decline of intergenerational coresidence and the decline in agricultural employment.³⁸ Given changes in general attitudes towards family values such as divorce, single-parenthood, and cohabitation, it seems that the decline in kin propinquity further reflected changing social norms revolving around kinship.

In 1790, 29% of persons lived adjacent to potential kin with the same surname. This number is conservative as we are missing many female-kin networks due to marriages. This suggests that at least in terms of proximity, kin relations were very powerful. Historians and economists such as Demos, Lemon, and Rothenberg argued in favor of a “modern” America based on the accumulation of property as capital, maximizing profits and an emphasis on conjugal families established separately from the previous

³⁷ Ronald L. Lewis, & Dwight B. Billings, “Appalachian Culture and Economic Development: A Retrospective View on the Theory and Literature,” *Journal of Appalachian Studies*, 3:1 (1997), 6-7.

³⁸ Ruggles (2007): 965. Ruggles (2015), 1801-1802.

generation.³⁹ These kin propinquity results place these conclusions into perspective. High kin propinquity in 1790 suggests families were more interested in the establishment of kin nearby rather than accumulating land, which would have been cheaper in new western lands than locally. Furthermore, the creation of new conjugal families next door does not support the argument of the modern family that travels to the best available economic opportunities.⁴⁰ The high rates of kin propinquity likely were related to many of the same reasons for intergenerational coresidence of elderly persons and adult children during this time period: a lack of economic opportunities for younger generations.

By 1940, kin propinquity declined to just over 8%. Economic opportunities grew as industrialization, rising land values, and better agricultural productivity no longer required and/or allowed children to live nearby. This decline was most evident for older generations who primarily lived near children. In 1850, over 28% of elderly persons lived near someone with the same surname compared to 18% of 20-year-old persons. By 1940, 8% of the elderly lived near potential kin, the same rate as 20-year-old persons.

The United States underwent various economic and demographic transitions during the nineteenth and early twentieth-centuries. Given the early high rates of kin propinquity compared to the low rates by 1940, the argument that the United States was “modern” appear to be based on weak assumptions of market and capitalist behavior. With the release of the new complete count IPUMS data, we can craft a better documented narrative of the long-run economic and demographic changes in the United States. Combined with local

³⁹ John Demos, *A Little Commonwealth: Family Life in Plymouth Colony*, 2nd ed., (New York: Oxford University Press, 2000). James T. Lemon, *The Best Poor Man's Country: A Geographical Study of Early Southeastern Pennsylvania*, (Baltimore: Johns Hopkins Press, 1972). Winnifred B. Rothenberg, *From Market-Places to a Market Economy: The Transformation of Rural Massachusetts, 1750-1850*, (Chicago: The University of Chicago Press, 1992).

⁴⁰ Gjerde (1997), 199-200, 203-207.

historical community studies and more recent survey evidence on kinship, we can better understand the strength and weakness of the kin network on demographic and economic outcomes.

Conclusion: Beyond the Household

For our fourth wedding anniversary, my wife Molly and I went to a vineyard and brewery to taste some local wines and beers. It just so happened that the winery we visited was located on a farm directly southwest of the Andrew Peterson farm.¹ Afterwards, we went to what is left of the Swedish Baptist Church cemetery next to the current golf course. Sure enough, Andrew, Elsa, and 8 of the 9 children were buried there, along with familiar names from the diary such as Per Daniel and Caroline Anderson, the Freeds, Swansons, Nelsons², and Brobergs. One of the pitfalls of quantitative history is you don't always become familiar with your subjects, simply because there are over 700 million persons in the data I used for this dissertation. Having spent all of this time reading, digesting, and analyzing Andrew's account book gave me this sense of intimacy with him, even if reading his journal only scratched the surface of who Andrew Peterson really was. Knowing that the people I read about stood on the very same ground over one hundred years ago is a feeling no digitized census can ever give you.

While we can and have learned a lot from analyzing information within households, we must look beyond the individual farmer and household to truly understand the trends and outcomes of farm families. My research does this in different ways. Chapter 2 looked at the contributions of neighbor labor towards the Peterson farm over the family life cycle. Chapter 3 looked at how systematic enumeration procedure biases and sociodemographic

¹ Interestingly, the vineyard is named Schram Vineyards Winery and Brewery. Andrew Schran was a neighbor Andrew approached whenever he had problems with livestock. While it's likely Schram Vineyards was named after the original farm owners as the winery is very close to the original farm, the Census records the surname as Schraun in 1860, Schraan in 1880-1920, and Andrew wrote Schran in his diary. The wine and beer were pretty good. The beer was not too hoppy, and the wines not overly sweet. The "Bonfire" Cabernet/Marquette could have used slightly more tannin but is a delicious local wine. I was not paid nor compensated for this review.

² No relation.

traits affected occupational returns of women and children. Chapter 4 looked at kin propinquity and what the overall trends tell us about the economic and demographic transformations of the United States during the nineteenth- and early twentieth-centuries.

Despite the Jeffersonian narrative of yeoman agriculture, invisible labor and invisible networks complemented male farm work. In many cases, the overall contribution of invisible labor superseded the contributions of individual male farmers. Andrew Peterson used neighbor labor when he had few or no other family members to assist in his work. Even later when his wife and children contributed more towards the farm work Peterson records, neighbor labor was still exchanged. However, even Andrew's diary was biased towards women's labor, and we need to continue writing about women's diaries to showcase the importance of women's labor on farms.

The importance of women's diaries is even more important in the context of the Census. Gender biases from the highest levels of the Census reported most women as "Keeping House" with no gainful employment.³ Further, evidence of enumerator bias affected occupational response rates for children. With complete count data, researchers need to control for this bias (especially for boys) when analyzing occupations. Enumeration procedures such as the month of enumeration and the sex of the household respondent also affected occupational returns for women and children. Beyond enumerator bias, socio-demographic factors such as age, marital status, and parental occupation were important predictors for occupational responses.

³ Nancy Folbre, "The Unproductive Housewife: Her Evolution in Nineteenth-Century Economic Thought," *Signs*, 16:3 (1991), 463-484. Nancy Folbre, & Marjorie Abel, "Women's Work and Women's Households: Gender Bias in the U.S. Census," *Social Research*, 56:3 (1989), 545-569.

Kin propinquity declined steadily from 1790 to 1940 largely due to urbanization and industrialization.⁴ Farm kin propinquity rates stabilized by 1910, suggesting that kin networks in rural areas were stronger than urban areas. Further, the high rates of kin propinquity in 1790 suggest that market participation was not the only focus of these families. Kin propinquity followed similar patterns in intergenerational coresidence and complex family structures for minority populations. The convergence in kin propinquity rates of young adults and elderly persons lends credence to the position that fewer children and children who left the farm drove these changes in living arrangements. Finally, kin propinquity is also a story of migration, as high kin propinquity areas were associated with lower migration rates than areas with low kin propinquity.

Improving methods around kin propinquity measures include comparing the results with verified genealogical data, using geocoded household data to better estimate kin propinquity in non-sequential enumeration districts, and analyzing linked panel data to better understand kinship beyond local kin propinquity. Comparing the results to verified genealogical data can help determine false kinship associations and how much kin propinquity was underreported due to not capturing female kin networks. Using geocoded household data will help to estimate kin propinquity in non-sequential areas, most notably large cities. Finally, analyzing panel data can allow for comparing kin who lived together or nearby at one point and 10 years later do not live near each other to better explain the decline of kin propinquity with more nuance. Ultimately, this work shows the power of

⁴ Daniel Scott Smith, "'All in Some Degree Related to Each Other': A Demographic and Comparative resolution of the Anomaly of New England Kinship," *The American Historical Review*, 94:1 (1989), 44-79.

complete count census data and will hopefully represent an expansion of our knowledge of historical demographic and economic circumstances in the United States.

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Appendix A: Andrew Peterson Diary Coding Description

The account book was coded using Google Forms to enter the data. Figures A-1 through A-3 show the basic design of the Google Form. I designed the Google Form to differentiate between “work” and “non-work.” For example, Peterson almost never worked on Sunday, indicating that Peterson and his family actively observed the Sabbath (or at least the illusion of it in his farm diary). Days where Peterson did not work because he was sick, attended a funeral or meeting, went fishing, etc. were considered “non-work” days. The most difficult days to comprehend were days he went to town. Work such as selling grain and livestock and purchasing farm implements occurred in town, but other times, his primary purpose for going to town was for consumption, such as buying sugar. Often, he did a combination of the two, and sometimes did not describe his reason for going to town. In order to maintain a standardized universe, going to town, regardless of the reason, is considered a “non-work” day.

The data was transferred to a Microsoft Access database and divided by location, task, people present, etc. To better capture the contributions of individuals rather than categories, the working universe (referred to as the Equivalent Labor Factor or ELF) is the total work events divided by the total work and non-work events. Since we do not have data for number of hours worked, I create a measure called a Labor Task Equivalent (LTE). For example, if Andrew, Per Daniel, and Broberg husked corn and then had a meeting later in the day, the contributions are considered as follows:

Figure A-1: First Page of Andrew Peterson Book Google Form

Peterson

* Required

Month *

Choose ▼

Day *

Choose ▼

Year *

Choose ▼

Was any work performed? *

Yes

No

How many tasks/non-work events are present?

Your answer _____

Figure A-2: Second Page of Andrew Peterson Book Google Form

Peterson

Task One

What work did Peterson do?

- Hay
- Mowed
- Wheat
- Corn
- Rye
- Barley
- Oats
- Timber
- Hauling
- Plowing
- Cleared land

Figure A-3: Second Page of Andrew Peterson Book Google Form, Continued

Where did the work take place?

- Peterson Farm
- Elsewhere

Who did Peterson work with?

- Elsa Peterson
- The boys
- Sture
- Axel
- The children
- Carl
- Frank
- Ida

Diary Entry: I husked corn. Per Daniel and Broberg helped. In the afternoon I went to a language meeting.

Work Event: Corn

Non-work Event: Meeting

Male Neighbors: 2 (Per Daniel, Broberg)

Andrew: 1

Equivalent Labor Factor = Work Events / (Work Events+ Non-work Events)

$$1 / 2 = 0.5$$

Labor Contribution = Number of Laborers present on a task

$$\text{Male Neighbor Labor} = 2 \text{ Peterson Labor} = 1$$

Labor Task Equivalent = Labor Contribution * ELF

Male Neighbor Contribution: $2 * 0.5 = 1$ labor task equivalent

Peterson Contribution: $1 * 0.5 = 0.5$ labor task equivalent

This provides the following generalizable equation

$$LTE_{if} = \left(\sum_{t \in \{1, 2, \dots, W\}} L_{ift} \right) * \left(\frac{W}{W + N} \right)$$

Where

LTE= Labor Task Equivalent

L=Labor Contribution

l=Form of labor (Peterson, Male Neighbor, Female Family, etc...)

f=Location of labor (Peterson Farm, Elsewhere, Both)

t=Indicator of specific task

W=Total Working Events for the day

N=Total Non-Working Events for the day

Two neighbors and Peterson completed a task. If the two neighbors were not present, it would have taken Peterson 2 labor equivalents to complete the same task. Given that they only worked a half day (because of the meeting), the labor needs to be adjusted by the Equivalent Labor Factor. This leads to the final measure of male neighbors

contributing 1 Labor task equivalent and Peterson 0.5 labor task equivalents. Work and non-work events are weighted equally (e.g. 1 work task=1 non-work event).

A more complicated example includes the following entry by Andrew Peterson on April 16, 1873;

In the morning I did various things. Malmborg split rails. In the afternoon I hauled stumps and roots. Plowed the new part of the orchard. Burnt the last grub, and brush on the grubbed field. Elsa and the children finished raking the brush today. Malmborg started grubbing in the meadow. Today Hank from Chaska and a reaper agent from St. Paul were here. I bought a Wood's reaper with the latest improvements from them for \$235.00 with the freight which is \$25.00. The freight I am to pay at once, then \$100.00 in June, 1874, and the rest, \$110.00 in June, 1875, also I am to pay 10% interest.

There are multiple events and persons present. This was split into the various tasks based on the people present.

Task 1: Plowing, Odds and Ends

Task 1 Labor: Peterson

Task 2: Timber, Grubbed

Task 2 Labor: Malmborg (1 Male Neighbor)

Task 3: Cleared land

Task 3 Labor: Elsa Peterson, the children (1 girl, 3 boys), Peterson

Non-work event: Social

I counted the purchase of the reaper as a social non-work event (consistent with my "Went to Town" classification), so $ELF=0.83$ ($5/(5+1)$). So the daily contribution for each form of labor for these tasks would be as follows in Table A-1:

Table A-1: Labor Task Equivalent Calculation for April 16, 1873

Events	Peterson	Male Neighbor	Female Family	Male Family
Work Events	5			
Non-work Events	1			
ELF	0.83			
Task 1 Labor Contribution	2	0	0	0
Task 2 Labor Contribution	0	2	0	0
Task 3 Labor Contribution	1	0	2	3
Total Labor Contribution (LC) for Day	3	2	2	3
LTE = LC * ELF	2.5	1.67	1.67	2.5

Peterson’s labor contribution was 3, Male Neighbor Labor was 2, Female Family 2, and Male Family 3. Once the equivalent labor factor is accounted for, the overall LTE for each group respectively is 2.5, 1.67, 1.67, and 2.5. While we don’t know if the others were working while Peterson talked with the reaper agents (they probably were) the calculation assumes the same ELF rate for all workers.

This is an imprecise, albeit best measure we can attain with the diary. Peterson typically did not record hours of work, meaning his task of planting apples may have only taken two hours. Based on the measure used here, if we assume an average work day (many farmers during the highest laboring season averaged as many as 14 hours per day)¹ would suggest a large number of hours. While certainly possible, we have no way to verify the actual hours worked. Using the LTE however, we can better approach the actual contribution of labor.

This absolute measure is preferred over a percentage of work because the amount of work varied by month due to the seasonal nature of agricultural labor. For example, neighbors could contribute 50% of the work in January, but if there were only 10 Labor Task Equivalent days for all groups in the month, this represents only 5 labor task

¹ Steven Ruggles, et al., *Integrated Public Use Microdata Series: Version 7.0* [dataset], (Minneapolis: University of Minnesota, 2017).

equivalent days. In August, neighbors may contribute only 25% of the labor, but if there were 50 labor task equivalents for all forms of labor, this represents 12.5 LTEs for neighbors.

Each task I coded included information on the type of task, where the task occurred, who worked on the particular task, and whether Peterson borrowed or lent tools/capital in order to complete a task. Non-work tasks were coded in a separate page of the form, and oddities or more detailed descriptions were recorded in the notes. Sometimes, a day would record multiple tasks at multiple locations. All tasks were separated by the individuals present. For example, let us say Peterson and Elsa dug up potatoes in the morning, and then Peterson and Per Daniel raked hay at both his home farm as well as Per Daniel's farm. In the form, the first task would be recorded as "Garden/Potatoes" at the "Peterson Farm" with "Andrew" and "Elsa" working. The second and third tasks would be recorded as "Hay" at both the "Peterson Farm" and "Elsewhere" with "Andrew" and "Per Daniel" working.

Another problem represents the concept of "farm laborer" vs. "neighbor." Peterson worked for someone for hire in the 1850s, but did not directly record this in his diary. For example, Peterson recorded "Raked Hay for Nilsson." Does this mean he did this as a neighbor, exchanging his labor with Nilsson, or did he do this as a laborer, where he was paid for his work? His diary does not always provide clarity on the issue. The closest indicator we have is the exchange of neighbor labor in the diary. Given that Peterson worked with a neighbor like Per Daniel who then worked on Peterson's farm the next day suggests that the two exchanged labor. Other times, Peterson would work for Nilsson, with little evidence of Nilsson ever working with Peterson on his home farm. This suggests

more of a farm laborer situation.

The concept of “settling accounts” complicates separating neighbor labor and hired labor. Often, instead of paying a neighbor, each farmer kept track of the work they performed and would later “settle accounts.” If Peterson worked 6 days for Per Daniel, but Per Daniel only worked 5 days for Peterson, then some form of exchange occurred whether it was payment in cash, goods, or a future promised exchange of labor. These relationships were driven by fictive and real kinship ties and business interests. In a diary entry on Sept 18, 1857 Peterson recorded

Broberg was again here and plowed the small field. We also made up our accounts. He was owing me one and a half dollar for corn meal. I had raked three days on what I owed him. He insisted that he did not want anything not even for taking my bag of corn which was about two bushels to the mill, but neither did I take anything for one fourth day's work which I spent hewing out the pieces for his wagon, also we had quit early both days we plowed, therefore no favor has been done for me although he tried to count it so.²

On December 11, 1857 Peterson recorded a second entry on Broberg. Peterson wrote “I spent 3/4 of a day on Broberg's account when I chopped down and split material for his sled, but perhaps, I won't get paid for more than a half day and that will be wrong because it was his fault for not coming to haul it home at the time he promised and that caused the delay.”³ Peterson clearly documented what he considered a fair exchange of his labor with Broberg. In an entry 10 days later, Peterson fumed about how he “Worked on Broberg's sled and finished it. I have worked on it 9 days except for a few odd minutes. He

² Andrew Peterson, & Emma M. Ahlquist (tr), *Andrew Peterson and Family Papers 1850-2007*, (St. Paul: Minnesota Historical Society, 2007), 39.

³ *Ibid*, 42.

only wants to pay at the rate of \$0.75 a day but I am determined to have \$7.00 for the work as was first agreed.”⁴ While this seems somewhat hostile, it also appears to be simply a recording of business. Six months later on June 9, 1858, Peterson “Went over to Broberg and grubbed to pay for the 2.5 days I owed him for planting corn for me.”⁵ The purpose of keeping accounts such as this seem to be less about distinguishing when one is “laborer” and “neighbor” but more about simply recording the work done and then settling on a fair exchange of services.

I recorded all information by individuals, but the data in the chapter is aggregated by different forms of labor. Ambiguous cases include Peterson clearly referring to more people than just himself but does not specify who. Sometimes, it is implied from previous day’s work. For example, if Andrew and Elsa dug potatoes on Monday and then Andrew records “We dug potatoes” on Tuesday, I assume that “We” means Elsa. Other times however, it is unclear who “we” refers to. These cases are recorded in a “We/Ambiguous” category.

A minor issue to note is Peterson traveled during some periods and did not record in his diary. These are recorded as non-work days unless specified. For example, in 1857, Peterson travelled to work for a man named Noyes for approximately 2 weeks.⁶ There is one spell between December 1857 and March 1858 where Peterson did not record anything in his diary but made no mention of where he was or who he worked for. I treat this spell as missing data. Finally, only six months of data are available in 1855 as Peterson migrated to Minnesota in June 1855.

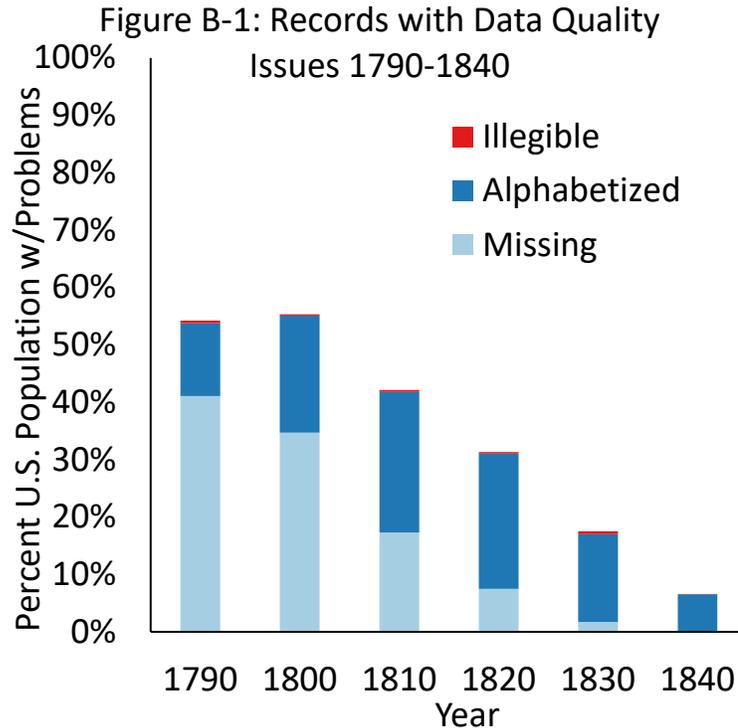
⁴ Ibid, 43.

⁵ Ibid, 50.

⁶ Ibid, 26.

Appendix B: Kin Propinquity Data Quality Issues

The 1790-1940 Census data provided by IPUMS¹ require adjusting the figures to accurately capture kin propinquity. In both 1790 and 1800, more than half of the population lived in areas where the data is either missing or alphabetized (Figure B-1). This requires the rates to be adjusted because if one had a large state with a high kin propinquity rate between 1790 and 1840 but missing in 1820, we can assume high kin propinquity in 1820. However, excluding this 1820 data would misrepresent kin propinquity. Figures B-2 through B-7 display the geographic distribution of these data problems.



¹ Steven Ruggles, et al., *Integrated Public Use Microdata Series: Version 7.0* [dataset], (Minneapolis: University of Minnesota, 2017). Steve Manson, et al., *IPUMS National Historical Geographic Information System: Version 12.0* [Database], (Minneapolis: University of Minnesota, 2017).

Figure B-2: Data Quality Issues by County, 1790

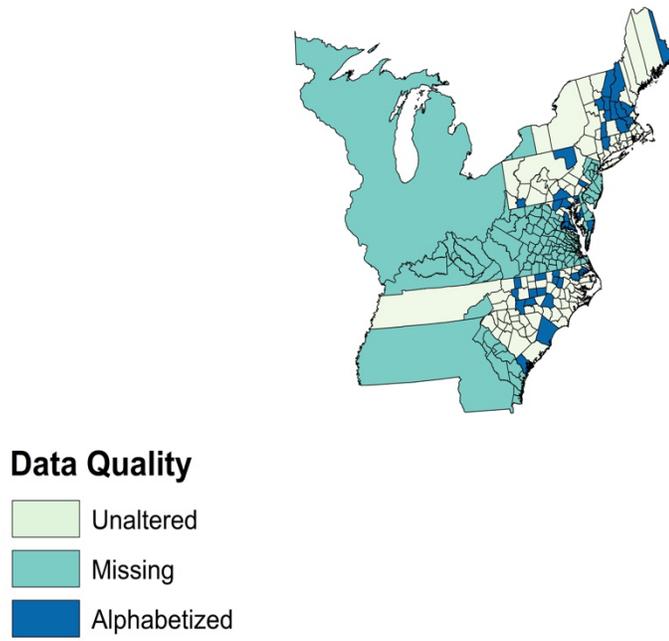


Figure B-3: Data Quality Issues by County, 1800

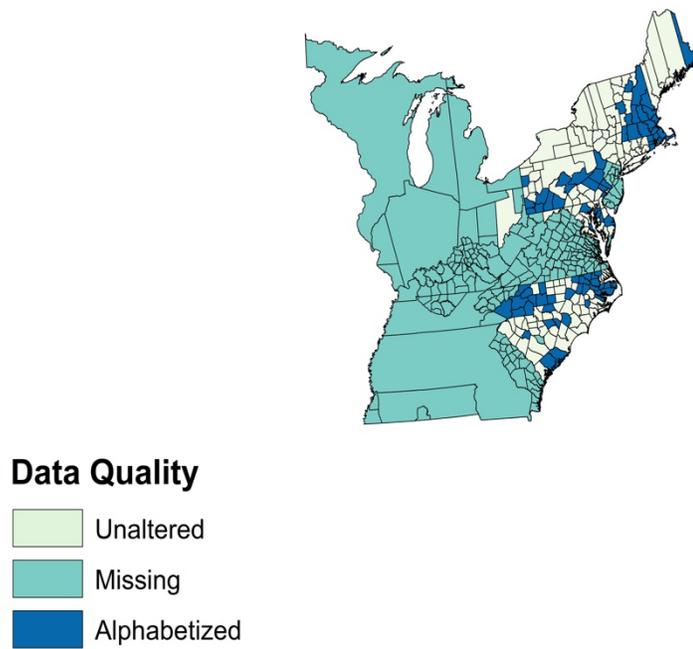


Figure B-4: Data Quality Issues by County, 18

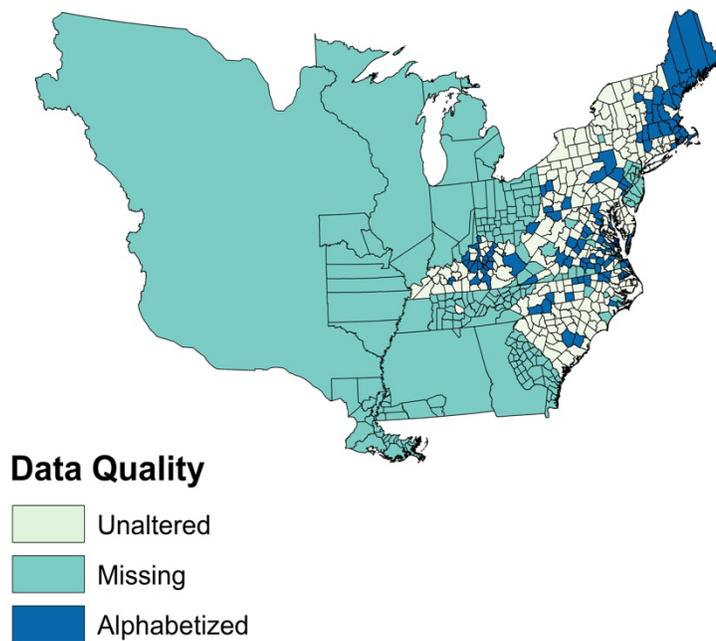


Figure B-5: Data Quality Issues by County, 1820

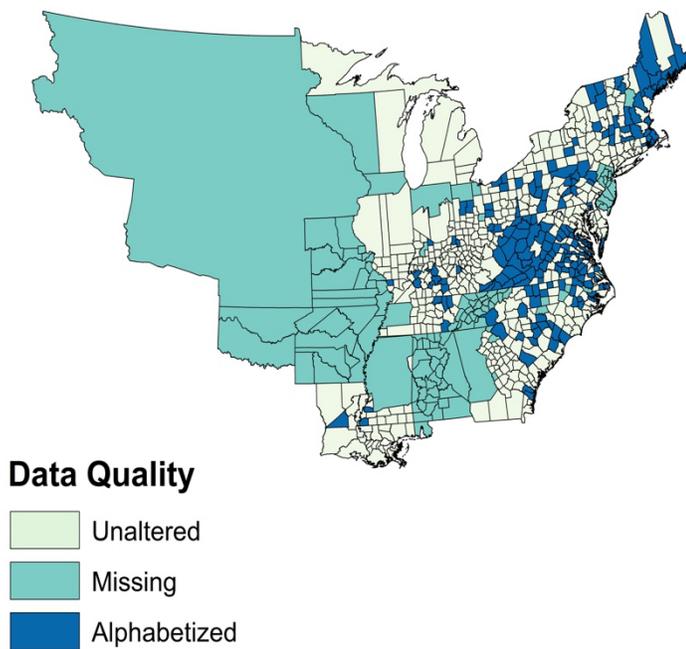


Figure B-6: Data Quality Issues by County, 1830

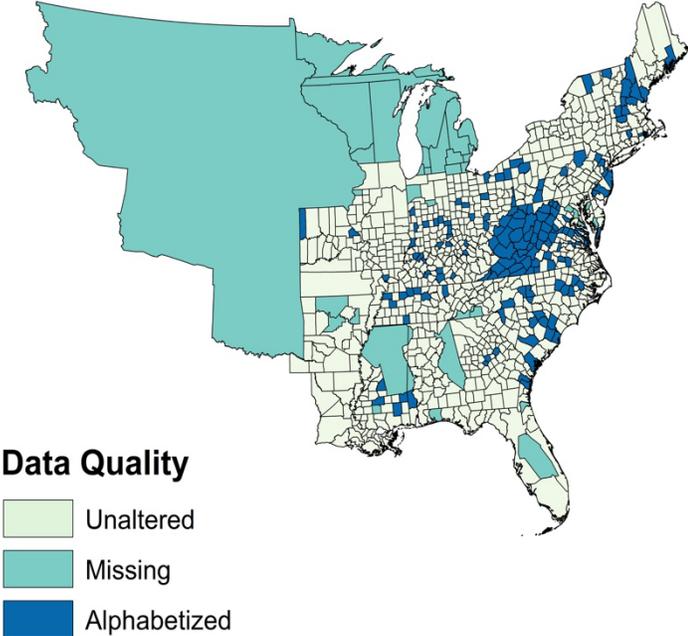
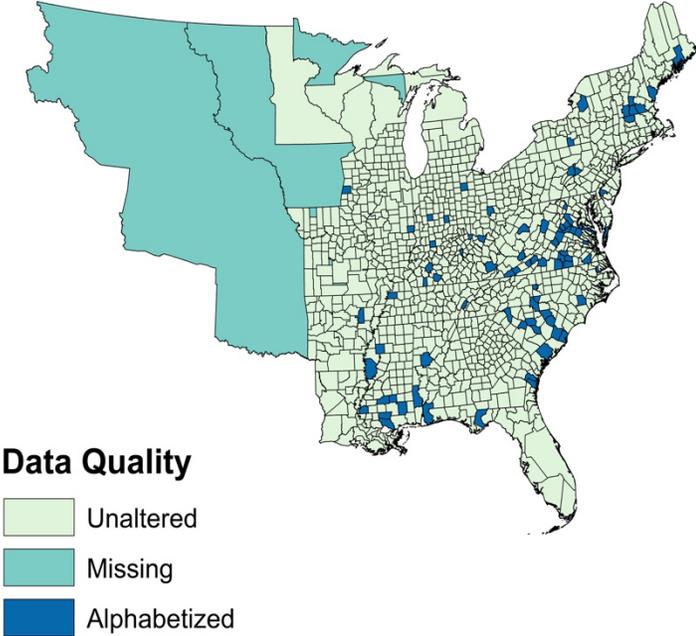


Figure B-7: Data Quality Issues by County, 1840



Typically, entire states are missing, though there are examples of select counties and cities that are missing while the remaining state remains intact. In regard to alphabetized records, Congress required marshals to post the enumeration in a public forum in order for residents to inspect the entries to insure accurate collection.² I speculate that creating a copy of the originals and alphabetizing the names made it easier for residents to identify their household. Unfortunately, if this copy survived instead of the original enumeration, it would violate the assumption of sequential enumeration that my kin propinquity method relies on and could bias the results upwards.

Some subdivisions³ did have significantly higher kin propinquity rates than others, meaning we cannot simply assume because an area had greater than 50% kin propinquity that the lists are clearly alphabetized. I developed a simple algorithm for identifying alphabetized areas. I gave the 26 letters in the alphabet a number based on their ordering in the alphabet (e.g. A=1, B=2, ..., Z=26). The program identified cases where the previous surname previous had a letter that occurred before the current surname in the alphabet (0=No, 1=Yes). For the enumerated area, I calculate the percentage of cases that the previous surname had the same or earlier letter in the alphabet than the current surname. This allowed me to identify alphabetized areas.

² *Census Act of 1790*, Public Law 2, 1st Cong., 2nd sess. (Mar 1, 1790), Statutes at Large of the United States of America, 1790-1873 1 (1845), 101-103. *Second Census of the Inhabitants of the United States*, Public Law 12, 6th Cong., 1st sess. (Feb 28, 1800), Statutes at Large of the United States of America, 1790-1873 2 (1845), 11-14. *Third Census of the Inhabitants of the United States*, Public Law 17, 11th Cong., 2nd sess. (Mar 26, 1810), Statutes at Large of the United States of America, 1790-1873 2 (1845), 564-568. *Fourth Census*, Public Law 24, 16th Cong., 1st sess. (Mar 14, 1820), Statutes at Large of the United States of America, 1790-1873 3 (1846), 548-552. *Fifth Census*, Public Law 40, 21st Cong., 1st sess. (Mar 23, 1830), Statutes at Large of the United States of America, 1790-1873 4 (1846), 383-389. *Census*, Public Law 80, 25th Cong., 3rd sess. (Mar 3, 1839), Statutes at Large of the United States of America, 1790-1873 5 (1856), 331-337.

³ Since enumeration districts did not exist in the pre-1880 data, I utilize the smallest available geographic units available, typically the town/township, although there are some cases where cities are separated into wards/districts.

Examples 1 and 2 from Table B-1 describe this process. Let's say we had the following 5 surnames: Anderson, Anderson, Nelson, Smith, and Thomas. In example 1, the names are alphabetized. Given the order in Example 1 below:

Table B-1: Alphabetized and Non-Alphabetized Records

Example 1		
Surname	First Letter Number	Previous Surname Earlier in Alphabet
Anderson	1	1
Anderson	1	1
Nelson	14	1
Smith	19	1
Thomas	20	1

Example 2		
Surname	First Letter Number	Previous Surname Earlier in Alphabet
Anderson	1	1
Nelson	14	1
Anderson	1	0
Thomas	20	1
Smith	19	0

The percentage of cases in this subdivision with the previous surname occurring before the current surname is 100%, suggesting the list has potentially been alphabetized. Example 2 on the other hand, shows only 60% of the names have been alphabetized, suggesting that these lists have potentially not been fully alphabetized. If 75% or more of the names within a subdivision were flagged as following another surname in the alphabet, and there were at least 7 households in the area, the area was flagged as an alphabetized region and not directly analyzed for kin propinquity. For areas in the 60%-75% range, the

data was viewed manually to determine alphabetized subdivisions. In some cases, the beginning part of the list was alphabetized but later parts of the list were not, indicating either updates to the enumeration or potentially multiple enumerators for an area. While not perfect, this method identifies a large swath of cases that cannot definitively be analyzed due to alphabetized lists.

Because of these data quality issues, these states and counties must have their rates adjusted. The first step to adjusting these states however requires identifying the number of households in each missing state. To estimate the number of missing households, I took the total free population for the state and estimate average family size for each census region. Using the average family size, I estimate the number of households in the missing states.

If the percentage of alphabetized records, illegible records, and missing records exceeded 30% for the state or county, the kin propinquity rates for the state and/or county are adjusted. Equation 1 and Table B-2 describe the adjustment procedure. Let's say that you have a census region composed of states a and b . State a has data quality issues in year t that require kin propinquity rate adjustment, state b is fine in year t . State a and state b both do not have data quality issues in year y . Assuming the ratio between states a and b from the same census region in year y is approximately equal to the ratio between the same geographic units in year t given N states in the Census region that the data can be adjusted from, the following general equation adjusts the kin propinquity rates for state a

Table B-2: Example of Adjusted Kin Propinquity Rates from Acceptable Rates

		Year t	Year y
	State a	Adjust Rate (r_{at})	Rate Fine (r_{ay})
$N \{$	State b	Rate Fine (r_{bt})	Rate Fine (r_{by})
	...	Rate Fine ($r_{b..t}$)	Rate Fine ($r_{b..y}$)

$$\text{Equation 1: } \bar{r}_{at|y} = \frac{\sum_{b \neq a}^N \left(\frac{r_{ay}}{r_{by}} * r_{bt} \right)}{N}$$

In Table B-3 below, 36.3% of the cases in 1830 New Jersey were alphabetized, illegible, or missing, thus requiring adjustment. The first step is to identify other states within the same census region as New Jersey that New Jersey can be compared against. In this example, the only two states that are a part of this region were New York and Pennsylvania. In 1830, New York and Pennsylvania respectively have 1.9% and 6.9% of records missing, illegible, or alphabetized.

Step 2 is to identify a year to adjust the rates from. Typically, I follow two criteria when selecting the adjustment year. First, I always select the closest year available for adjusting the data. Second if there is a tie between two years (e.g. adjusting 1830 and there is good data in both 1820 and 1840) I always select the year forwards in time (in this case 1840) because the data quality generally improves moving forward in time compared to backwards. For example, if we can adjust the rates from 1810 or 1840 for 1830, I select 1840. In this specific case, 1840 was the closest year to adjust 1830 from. In 1840, the percentage of records missing, illegible, or alphabetized for New Jersey, New York, and Pennsylvania respectively were 6.4%, 2.2%, and 1.8%. Given this, we adjust kin propinquity rates for New Jersey in 1830 given 1840;

Table B-3: Adjustment of New Jersey 1830 Kin Propinquity Rate Example

	State		Year		r_{ay}/r_{by}	$r_{at y}$
			t	y		
	New Jersey	a	N/A	20.64		
r	New York	b ₁	20.50	17.64	1.17	23.99
	Pennsylvania	b ₂	21.16	19.28	1.07	22.65

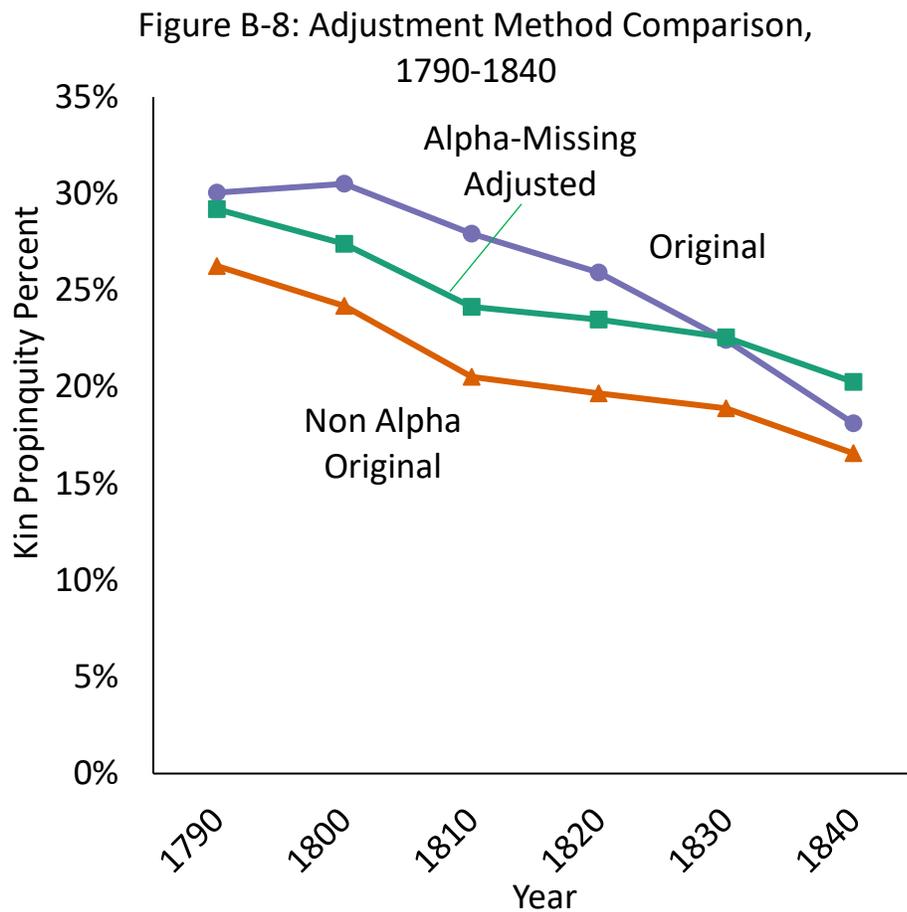
$$\bar{r}_{at|y} = \frac{\sum_{b \neq a}^N \left(\frac{r_{ay}}{r_{by}} * r_{bt} \right)}{N} = \frac{\left(\frac{r_{ay}}{r_{b_1y}} * r_{b_1t} \right) + \left(\frac{r_{ay}}{r_{b_2y}} * r_{b_2t} \right)}{2} =$$

$$\frac{\left(\frac{20.64}{17.64} * 20.50 \right) + \left(\frac{20.64}{19.28} * 21.16 \right)}{2} = \frac{23.99 + 22.65}{2} = 23.31$$

Taking the average predicted kin propinquity rate of New Jersey in 1830 given 1840 ($r_{at|y}$) for each state in the Census region gives us a final kin propinquity rate of 23.31%.

After performing this adjustment for every state and every year, I repeat the same method at the county-level. At the state level, I never compare states to other states with data quality issues. Counties however are compared to the state-level rate, even if the state-level rate was adjusted. I do this for two reasons. First, I want to insure the county-rates when aggregated roughly match to the state-level rates, and not comparing the county-level rates to state-level rates could introduce large discrepancies between county-level numbers and state-level numbers. Secondly, data quality issues for states that are entirely missing and states missing a large chunk of data (e.g. New Jersey is missing data between 1790 and 1820 and alphabetized in 1830) means we would adjust 1790 county rates from 1840 county data, which seems less ideal than predicting from an adjusted state rate from 1800.

Figure B-8 shows the importance of fixing alphabetized areas. The Original line represents the data with no effort to adjust the rates. Non-alpha Original represents removing alphabetized records, but not adjusting for these cases or missing areas. The Alpha-Missing Adjusted line represents adjusting the rates for alphabetized and missing areas. When removing alphabetized records from the analysis (triangle), kin propinquity is sharply lower than what the original records (circle) suggest. The Alpha-Missing adjusted line (square) shows a parallel but higher trend than simply removing alphabetized records. I will revisit the accuracy of the adjustment method at the end of the appendix.



Distance of Analysis

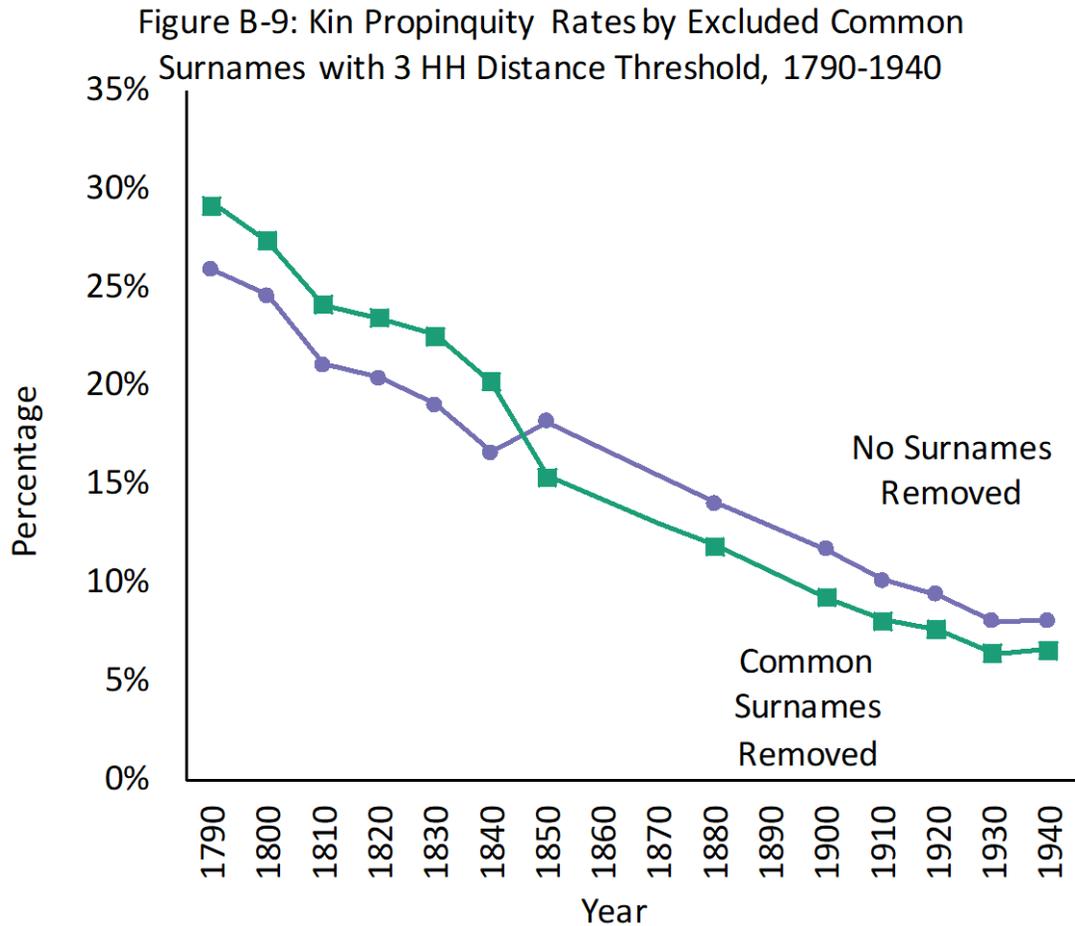
The distance threshold is a relative measure as it does not consider the actual physical distance between households. A distance threshold of 3 could in theory be several miles in a frontier 1790 setting while it could literally be in the same apartment building in 1940 New York City. On the one hand, a small threshold (3 households or closer) while a conservative estimate, makes up the majority of the links in every year. However, this likely underreports kin propinquity in urban areas. While 50 households are arguably more reasonable, the inability to identify false positive matches means that the likely number of false positive matches increases when using a large distance threshold. When using 50 households, the majority of the links are still made in the first three households.

I investigated using the entire enumeration district and entire census tract in 1940 for urban areas. While kin propinquity rates increased dramatically, there are huge differences in rates between common surnames and less common surnames, suggesting a high risk of false kinship associations. Currently, until links can be verified using genealogical methods to identify true links, using conservative measures imply making the least number of false positive links while still capturing the largest number of actual links. Furthermore, the trends are all the same regardless of which distance threshold is chosen, suggesting that using a distance threshold of 3 will tell a similar (if not the exact same) story as a distance threshold of 50.

Common Surnames

One concern about the data is since we cannot definitively identify a true kinship link, common surnames such as “Smith” may lead to misleading results. To control for

common surnames, I calculate the distribution of each surname by state and race for each census year.⁴ Based on the distribution, I calculate the probability that a surname would randomly show up within a specified distance threshold. I calculate kin propinquity rates excluding cases where the probability of a surname randomly occurring is more than 1% of the time. Figure B-9 below shows kin propinquity rates for 1850-1940. The trend with circles represents the kin propinquity rates with no surnames removed. The trend with squares represents kin propinquity rates with surnames that have a 1% or higher probability of occurring randomly excluded.



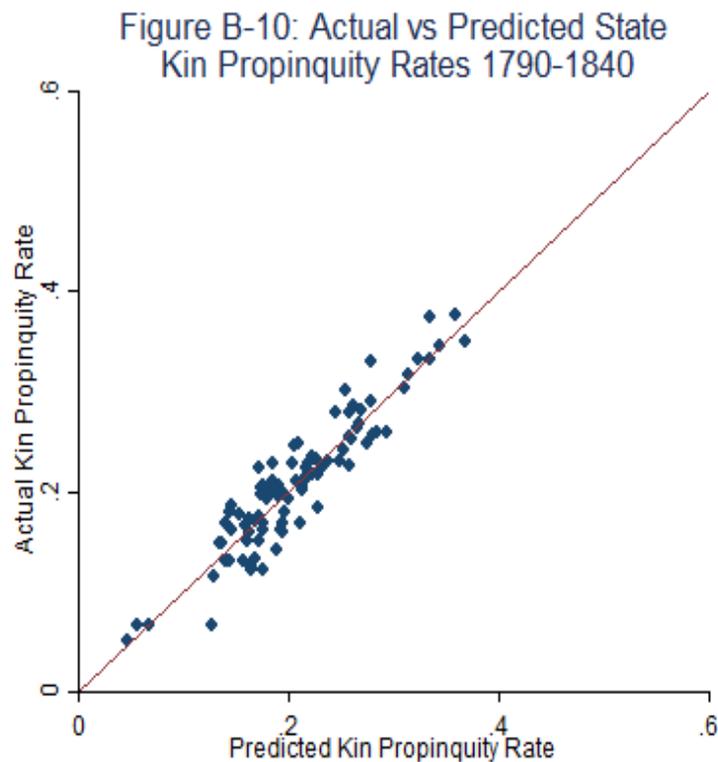
⁴ Since race is not directly enumerated for heads of household for 1790-1840, I only calculate the surname distribution within the state.

When excluding common surnames that have a 1% or higher probability of occurring randomly, kin propinquity rates decline 2.03% point on average (highest is 1850 at 2.78% and lowest is 1940 1.49%). The national trends overall show little bias due to common surnames based on this analysis. Higher kin propinquity when removing common surnames in the pre-1850 period than not removing them is due to the household-level linking versus individual level linking. For example, the surname Bell in 1850 in one state and race makes up 0.27% of the surnames. In a scenario where the 6 surrounding households of the Bell household have 2-person households, a distance threshold of 1 has a higher than 1% chance of randomly occurring. However, when selecting only heads of households, the same surname in the same state and race now only makes up 0.09% of the surnames and going to a distance threshold of three suggests only a 0.54% chance of randomly occurring. The individual method is far more restrictive than the household method when accounting for common surnames because household may include multiple surnames, thus more records are dropped, and likely explains why the kinship rates without common surnames in 1790-1840 is lower than the trend with common surnames. Adjusting kin propinquity rates between 1790 and 1840 without common surnames also explains some of these differences as well.

Accuracy of Adjusted Rates 1790-1840

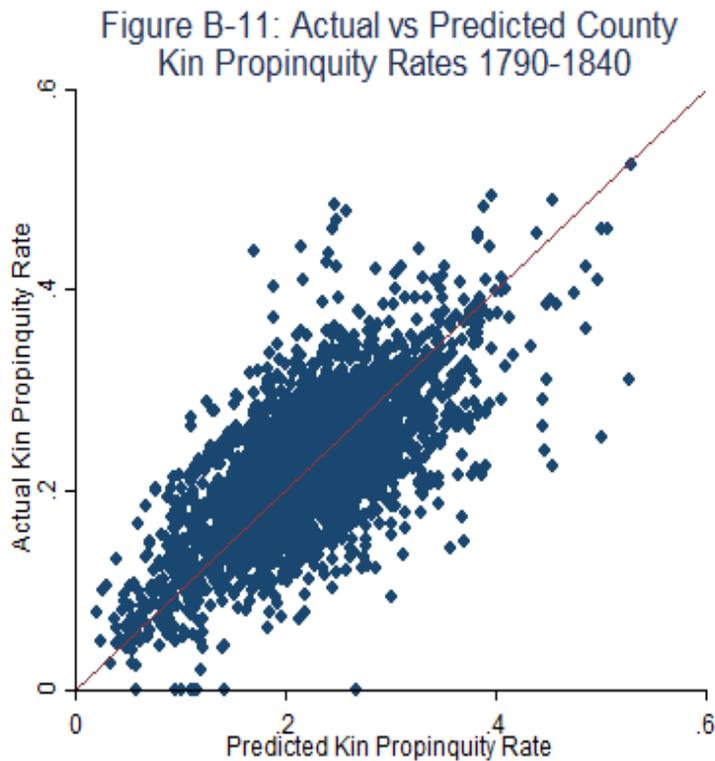
The data quality issues for the 1790-1840 data raises questions on whether the adjustments accurately capture these missing areas while controlling for common surnames. Comparing the predicted adjusted values to actual kin propinquity values for states with no data quality issues could serve as a potential test for accuracy. Doing this for the data suggests a very low error rate. Using a three-household distance threshold, I find

an average error of -0.07% (median error is -0.18%) from the actual kin propinquity rate. The largest error is a predicted adjustment that is 5.93% points larger than the actual rate. Figures B-10 and B-11 shows the distribution of the predicted vs actual rates with a 45° reference line at the state and county level. This suggests that the rates seem relatively accurate for states with good kinship rates. Given that we have no reason to assume that the model performs worse for missing data, I argue that the method plausibly measures kin propinquity in these missing areas.



County kin propinquity rates show more error than the state rates. 90% of the predicted kin propinquity rates are 9.06% below the actual rates or 8.79% above the actual kin propinquity rates. Some outliers go as high as 26.79% above or below the actual rates. These cases involve boundary changes, typically in the territories as they become states and settled. Another scenario with widely diverging rates was Suffolk County, MA. The

data in 1790 includes Boston and surrounding rural areas. By 1800, many of the surrounding rural areas became new counties, meaning the demographic composition of Suffolk County in 1800 is vastly different, leading to widely different predicted rates. Given that the median error rate is -0.34% (average error rate -0.19%), I'm still inclined to conclude that excluding territories or boundary changes, the method performs reasonably well.

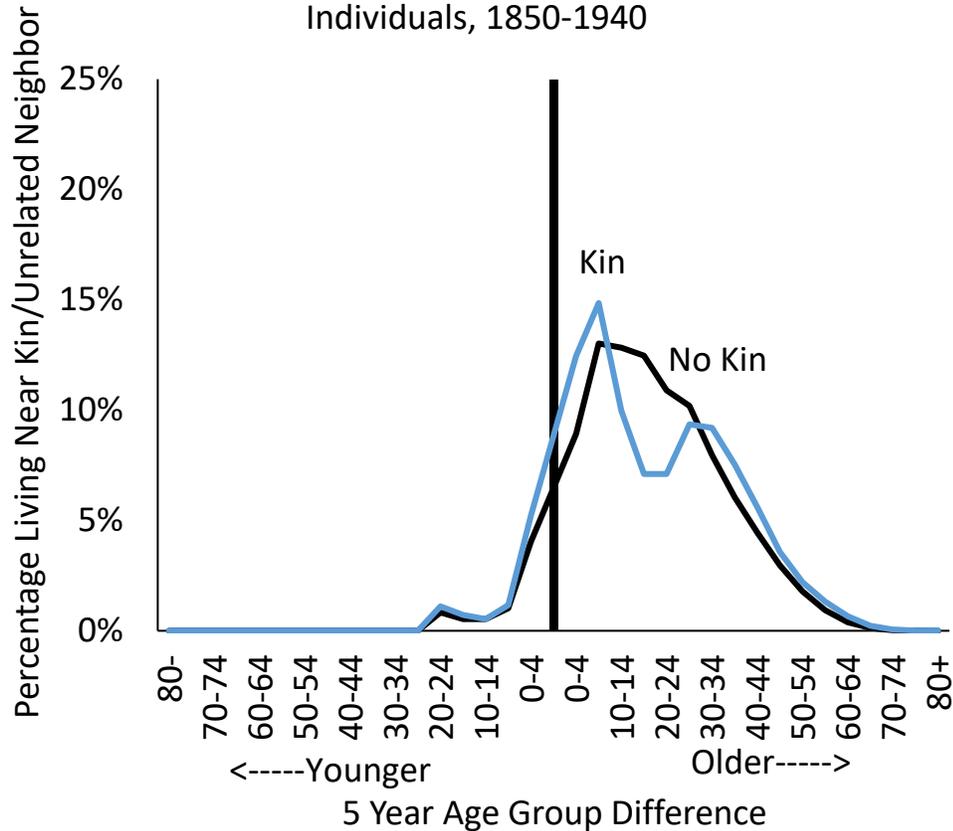


Accuracy of Overall Method 1850-1940

One concern with the method is that we don't know the false positive rate of matches. Excluding common surnames should reduce the false positive rate, but still does not fully answer whether the method itself is accurate. One possible way to get at this is comparing the ages of matched kin with those of unmatched kin and neighbors. For example, with unrelated neighbors, I expect to see a normal distribution of age differences

between neighbors. For kin however, given a life course interpretation of kin availability and living arrangements, I would not expect to see the same normal distribution as those of unrelated neighbors, but specific ages with large spikes due to the life course.

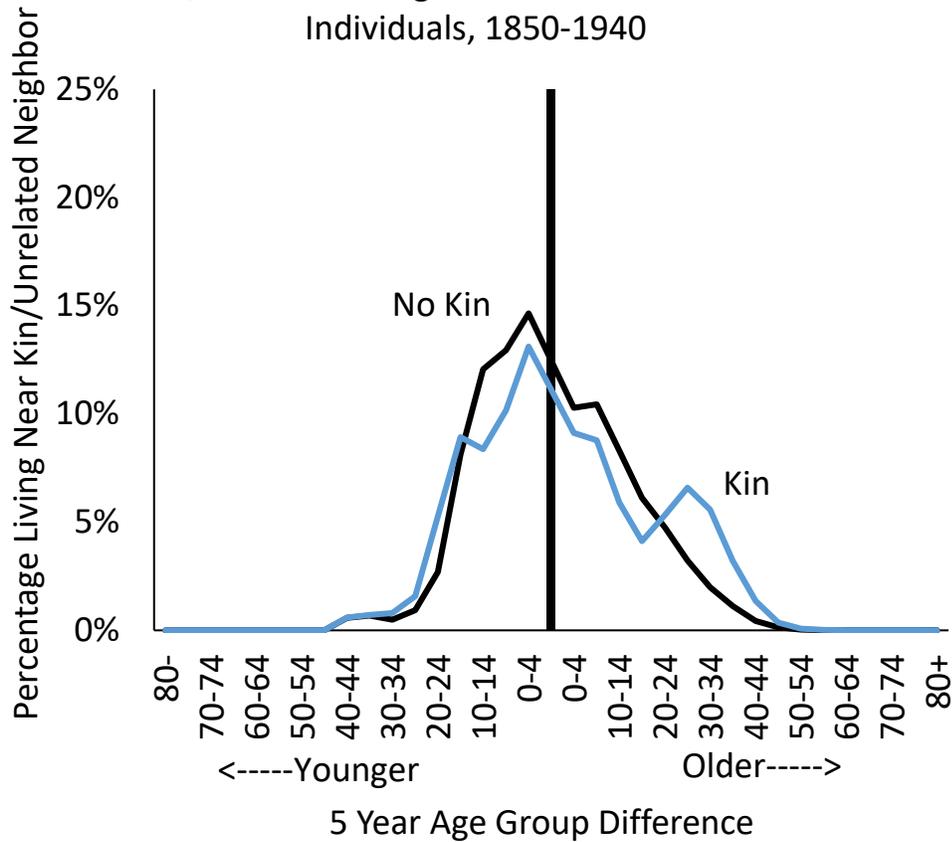
Figure B-12: Age Difference Between Nearby Kin/Unrelated Neighbors and 20-24 Year Old Individuals, 1850-1940



Figures B-12 through B-14 show the age differences between associated kin compared to the age differences of unrelated neighbors for 20-24, 40-44, and 60-64-year-old persons. What we see are differences between those who live near kin and those who do not. 20-24-year-old persons were more likely to live near someone older than them regardless of whether the neighbors were kin or not. However, there is a larger spike for those living near kin for 0-4 years older when compared to living near unrelated neighbors.

Further, a larger difference between these two groups existed for 10-24 years older than the 20-24-year-old persons. 40-44-year-old persons patterns were similar (albeit lower) to people with unrelated neighbors except for a spike in the 25-34 years older age difference (parents).

Figure B-13: Age Difference Between Nearby Kin/Unrelated Neighbors and 40-44 Year Old Individuals, 1850-1940



Finally, for 60-64-year-old persons, the patterns of the two groups are very different, with a large spike of kin propinquity towards potential children compared to those with unrelated neighbors. The differences in the distributions for Figures B-12 through B-14 lend credence to the accuracy of the method as there is no reason for these distributions to be different if there was not an actual difference between the two groups.

Figure B-14: Age Difference Between Nearby Kin/Unrelated Neighbors and 60-64 Year Old Individuals, 1850-1940

