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Local Historical Context and
Multigenerational Socioeconomic Attainment

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Abstract: We present an analytical model that outlines different pathways through which local contexts, defined as bounded geographic areas, shape socioeconomic attainment in three generations. Our model broadens the multigenerational research agenda, which has mainly focused on transmission within the family, and offers a framework for analyzing how exogenous shocks to local contexts could be used to test causal hypotheses. We use a descriptive case study of 20th century Wisconsin to illustrate how we can interpret empirical associations between characteristics of local contexts and socioeconomic attainment in three generations within our model. We end by considering how we could extend our model to capture a more complex set of contextual factors and how we could use it to address inferential challenges in multigenerational research.

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1. Introduction

A growing literature in social stratification research focuses on multi-generation rather than on two-generation socioeconomic attainment and mobility (Warren & Hauser 1997; Mare 2011, 2014; Pfeffer 2014; Anderson, Sheppard & Monden 2018; Daw, Gaddis & Morse 2020). This literature is important because it focuses on how socioeconomic advantage is created and maintained across generations and how social inequality evolves over time (Mare 2011; Piketty 2014; Lindahl et al. 2015; Xi et al. 2020). Among other things, this literature shows that family relationships beyond the nuclear family matter (Jæger 2012; Hällsten 2014) and that grandparents' wealth (Møllegaard & Jæger 2015; Hällsten & Pfeffer 2017), education (Zeng & Xie 2014), age at child-bearing (Fomby, Krueger and Wagner 2014) and occupational status (Chan & Boliver 2013; Knigge 2016; Kong, Maas & Leeuwen 2020) correlate with grandchildren's socioeconomic attainment.

In this paper, we argue that multigenerational research would benefit from a broader analytical perspective that, in addition to transmission within the family, also addresses the local contexts in which each generation lives. We define local contexts as bounded geographic areas whose populations and institutions have particular economic, social, and cultural characteristics. To provide a broader analytical perspective, we present a model with three generations that describes different pathways through which local contexts in each generation affect socioeconomic attainment in this and later generations. The key ideas in our model are that local contexts (a) affect socioeconomic attainment in the generation exposed to them; (b) have intergenerational implications because ancestors' attainment affects descendants' attainment; and (c) have different impact across generations due to change in their characteristics over time. We argue that local contexts are important for two reasons.

First, most multigenerational research focuses narrowly on transmission within the family, i.e., the extent to which ancestors' socioeconomic attainment is associated with descendants' attainment (Anderson, Sheppard & Monden 2018; Daw, Gaddis & Morse 2020). By including local contexts, we broaden the perspective and address how ancestors' exposure to more or less favorable contexts affect descendants' attainment and, in addition, how contexts themselves directly affect the generations exposed to them. In this regard, incorporating local contexts enables us to address "grand-neighborhoods" and how "... social institutions, broadly construed, give rise to multigenerational effects because they transcend the lives of individuals" (Mare 2011:2, 12). To motivate our model, we draw on theoretical models of intergenerational transmission that include factors outside the family (Durlauf 1996; Solon 2009, 2015) and empirical research that shows that neighborhood characteristics affect children's socioeconomic attainment in one (Brooks-Gunn et al 1993; Sampson, Morenoff, & Gannon-Rowley 2002; Sharkey & Faber 2014; Chetty & Hendren 2018a, 2018b) and two generations (Sharkey & Elwert 2011; Hedman et al 2015).

Second, most multigenerational research provides descriptive answers to causal questions. Recent research highlights the inferential challenges associated with causal interpretations in multigenerational settings, for example challenges from omitted variables, measurement error, and social gradients in fertility and mortality (Lawrence & Breen 2016; Breen 2018; Engzell, Mood & Jonsson 2020). Some research has used exogenous variation in ancestors' socioeconomic attainment, for example from historical events or shocks to local contexts, to address causal hypotheses (Sacerdote 2006; Painter et al. 2008; Bleakley & Ferrie 2016). For example, Xie and Zhang (2019) use the Cultural Revolution in China as an exogenous shock to study social mobility in a three-generation setup. Although promising, this research often lacks an analytical framework for thinking about how exogenous shocks to

local contexts could be used to frame and test causal hypotheses. The analytical model we present in this paper offers a starting point for such a framework.

We use a descriptive case study of 20th century Wisconsin to illustrate how our model helps to contextualize the analysis of multigenerational socioeconomic attainment. We focus on Wisconsin because of its immigration history, which created rich variation within and between local contexts, and because we have data on socioeconomic attainment for three generations living in Wisconsin (born around 1910, 1940, and 1960, respectively). We estimate empirical associations between characteristics of local contexts (economic, cultural, and social) and socioeconomic attainment in each generation, as well as two- and three-generation associations between local contexts and attainment. The case study helps to contextualize and interpret processes of multigenerational socioeconomic attainment.

2. Analytical Model

We begin by presenting an analytical model that integrates local contexts into the analysis of multigenerational socioeconomic attainment. We think of this model as analytical rather than theoretical because, rather than postulating a specific set of mechanisms from which we derive testable hypotheses, it outlines a general set of pathways that describe how local contexts might affect multigenerational attainment. We should clarify three things before presenting the model. First, because the model is analytical rather than theoretical, we do not describe every way in which we might extend it to accommodate a more complex scenario. Instead, in the discussion section of the paper we address a set of plausible extensions of the model. Second, although the model includes three generations and thus spans at least 60 years of historical time, it is not specific to any particular historical context or period. Consequently, any empirical application of it must pay attention to the historical context in which it is applied. Third, while the model specifies causal pathways, our case study is based

on empirical associations that have no causal interpretation. Thus, our ambition is to illustrate how we can use the model to interpret empirical associations. Figure 1 summarizes the key features of our model, which includes three generations (labeled g_1 , g_2 , and g_3). We begin by presenting key ideas verbally and then summarize them in a simple formal model.

– FIGURE 1 HERE –

2.1 Markov Transmission

Standard models of intergenerational transmissions focus on two generations: parents and children. Most of these models assume that intergenerational transmissions follow a Markov process in which endowments and investments in the parent generation affect outcomes in the child generation (Becker & Tomes 1979, 1986). In Figure 1, we use the letter m to capture Markov transmission (along with subscripts g to denote generations). Our model includes two Markov pathways: $m_{g_1g_2}$ that summarizes the effect of g_1 attainment on g_2 attainment and $m_{g_2g_3}$ that summarizes the effect of g_2 attainment on g_3 attainment.

2.2 Second-Order Markov Transmission

Intergenerational transmissions may be of a second order if characteristics of more distant relatives such as grandparents have a direct effect on grandchildren's socioeconomic attainment (e.g., Chan & Boliver 2013; Hällsten & Pfeffer 2017; Knigge 2016; Zeng & Xie 2014). Distant relatives affect children via resources and exposure, for example if grandparents transmit wealth to grandchildren without going through the parent generation or if they provide supportive family environments (Mare 2011). In Figure 1, we use the letters sm to capture second-order Markov transmission and include the pathway $sm_{g_1g_3}$ to capture the direct effect of g_1 attainment on g_3 attainment.

2.3 Local Context

We now extend the model to include local contexts. Theoretically, we motivate this extension from models of intergenerational transmissions that include factors outside the family, for example public policy and institutions (Durlauf 1996; Solon 2015). Empirically, we motivate it from research on neighborhood effects and historical correlates of social mobility (Brooks-Gunn et al 1993; Sharkey & Faber 2014; Berger & Engzell 2019; Xi et al. 2020).

We begin by defining what local contexts are and how they operate. At the most general level, local contexts are bounded geographic areas whose populations and institutions have particular characteristics. Although it is difficult to delimit local contexts, we think of them as larger than the immediate neighborhood because they include legal and social structures that persist over time (Tolsma & van der Meer 2017; Ruef & Grigoryeva 2018). Differences between local contexts originate in a number of factors, for example natural resources, immigration patterns, and political organization (Nunn 2012; Alesina & Giuliano 2015). Once established, local contexts operate at different levels and in complex ways. We draw on ideas from geography to argue that local contexts differ with regard to economic, social, and cultural characteristics (Redding 2013; Mitchneck 2017). *Economic characteristics* include, for example, local labor markets, educational opportunities, and residential patterns. *Social characteristics* include, for example, local social networks, ethnic and national diversity, and demographic and family composition. Finally, *cultural characteristics* include, for example, local religious composition, belief systems, and cultural practices. We argue that local contexts create an *opportunity structure* that shapes prospects of socioeconomic attainment for those exposed to them (Cloward & Ohlin 1960; Chetty et al. 2014; Berger & Engzell 2019). Differences in the opportunity structure materialize in, for example, different access to education, labor markets and housing, as well as in different

returns to education and jobs based on social networks and personal traits (e.g., ethnic background). For example, in our empirical case study we argue that variation in the local opportunity structure across Wisconsin reflects local differences in economic, social, and cultural characteristics that, among other things, arose from German and Norwegian immigrants settling in different areas.

In Figure 1, we use boxes with dotted lines and the letter c to capture how local contexts shape the local opportunity structure to which each generation is exposed. A positive effect of c , illustrated by rounded arrowheads in Figure 1, and a positive coefficient on the parameter γ (which we introduce shortly), indicates that, on average, living in a local context with a more open opportunity structure has a positive effect on socioeconomic attainment. As we explain below, characteristics of local contexts in the past also matter because they shape the local contexts to which later generations are exposed.

2.4 Direct and Indirect Pathways

We now summarize the key ideas outlined above in a simple formal model that distinguishes five pathways through which local context might affect multigenerational socioeconomic attainment. First, the local context in which each generation lived might have a direct effect on socioeconomic attainment in that generation (we label this effect the *context pathway*). Second, the local context in the first (second) generation might affect the attainment of the second (third) generation by shaping the attainment of the first (second) generation, which in turn affects that of the second (third) generation (the *Markov pathway*). Third, the local context in the first generation might affect socioeconomic attainment in the third generation indirectly via the attainment of the first and second generation (the *multigenerational Markov pathway*). Fourth, the local context in the first generation might affect socioeconomic attainment in the third generation directly via the attainment of the first generation (the

second-order Markov pathway). Finally, the local context in the past might affect the local context to which the current generation is exposed, which in turn affects socioeconomic attainment in the current generation (the *past context pathway*).

We now summarize the ideas outlined above in a simple formal model. In the following, y refers to socioeconomic attainment (and we use subscript g to distinguish generations), c refers to local context, and e refers to other factors that affect attainment. We write a model for the effect of local context on socioeconomic attainment in the first generation

$$y_{g1} = \gamma_1 c_{g1} + e, \quad (1)$$

where γ_1 captures the direct effect of local context c_{g1} on socioeconomic attainment (i.e., the context pathway), and e captures the influence of other factors. We assume that e is orthogonal to c_{g1} , but below we outline different components in e in later generations.¹

We write a model for the attainment of the second generation

$$y_{g2} = \gamma_2 c_{g2} + \phi_1 y_{g1} + u, \quad (2)$$

¹ This presentation simplifies our analytical argument since it assumes that we may summarize the effect of local context on socioeconomic attainment with a single coefficient. We use this simplified notation for expositional purposes. Conceptually, it would be straightforward to extend the model to include multiple dimensions of local contexts (economic, social, and cultural), each of which has a different effect on socioeconomic attainment. We address this and other extensions of the model in the discussion.

where γ_2 summarizes the direct effect of local context c_{g2} on socioeconomic attainment, ϕ_1 captures the effect of y_{g1} (which in part depends on c_{g1} , cf. Equation 1), and u captures other factors.

Finally, we write a model for the attainment of the third generation

$$y_{g3} = \gamma_3 c_{g3} + \phi_2 y_{g2} + \phi_3 y_{g1} + d, \quad (3)$$

where γ_3 summarizes the direct effect of local context c_{g3} on attainment, ϕ_2 and ϕ_3 capture the effects of respectively y_{g2} and y_{g1} (both of which depend in part on c_{g2} and c_{g1}), and d captures other factors. Including $\phi_3 y_{g1}$ accounts for second-order Markov transmission, i.e., $g1$ attainment affecting $g3$ attainment independently of $g2$ attainment (cf. sm_{g13} in Figure 1).

Equations 1-3 describe generationally contemporaneous direct pathways through which local contexts might affect socioeconomic attainment in each generation, as well as indirect pathways via the attainment of previous generations (i.e., the context, Markov, and multigenerational and second-order Markov pathways). The last pathway we consider is the past context pathway. Figure 1 illustrates cross-time persistence in local contexts via the arrows from c_{g1} to c_{g2} and from c_{g2} to c_{g3} . We write a model that describes cross-time persistence in local contexts

$$\begin{aligned} c_{g2} &= \delta_1 c_{g1} + i_{g2}, \\ c_{g3} &= \delta_2 c_{g2} + i_{g3}. \end{aligned} \quad (4)$$

Here, δ captures the effect of the local context at the time when the past generation was young on the local context to which the next generation is exposed, and i

captures other factors.² Combined with the pathways described in Equations 1-3, we may summarize the different pathways through which local contexts affect socioeconomic attainment in each generation as follows

$$\begin{aligned}
 y_{g1} &= \gamma_1 c_{g1} \\
 &\quad \text{Context pathway} \\
 y_{g2} &= \gamma_2 c_{g2} + \underbrace{\gamma_2 [\delta_1 c_{g1}]}_{\text{Past context pathway: g1 context via g2 context}} + \underbrace{[\phi_1 \gamma_1] c_{g1}}_{\text{Markov pathway: g1 context via g1 attainment}} \\
 y_{g3} &= \gamma_3 c_{g3} + \underbrace{\gamma_3 [\delta_2 c_{g2}]}_{\text{Past context pathway: g2 context via g3 context}} + \underbrace{[\phi_2 \gamma_2] c_{g2}}_{\text{Markov pathway: g2 context via g2 attainment}} + \underbrace{[\phi_1 \phi_2 \gamma_1] c_{g1}}_{\text{Multigenerational Markov pathway: g1 context via g1 and g2 attainment}} + \underbrace{[\phi_3 \gamma_1] c_{g1}}_{\text{Second-order Markov pathway: g1 context via g1 attainment}}
 \end{aligned}
 \tag{5}$$

Equation 5 describes different pathways, both inside the family (Markov, multigenerational Markov, and second-order Markov pathway) and outside of it (context and past context pathway) through which local contexts might affect socioeconomic attainment. Compared to existing research, this model explicates how local contexts – past and present – affect multigenerational attainment. Moreover, it may be used as a starting point for thinking about how variation in, and exogenous shocks to, local contexts might be used to address causal hypotheses in multigenerational settings.

In the next sections, we use a case study of 20th century Wisconsin to illustrate how we can use our model to interpret empirical associations between characteristics of local contexts and socioeconomic attainment in three generations. We begin by providing historical context, including how immigration to Wisconsin helped to create variation in local economic, social, and cultural characteristics and in the opportunity structure to which each generation was exposed. We then present and motivate a set of variables measured at the

² Our model includes three generations. However, with an arbitrary number of generations we can summarize it as follows: $y_g = \gamma c_g + \phi_1 y_{g-1} + \phi_2 y_{g-2} + w_g$ and $c_g = \delta c_{g-1} + i_g$.

county level intended to capture economic, social, and cultural characteristics of local contexts. Finally, we present individual-level data on socioeconomic attainment, the research design, and the main findings.

3. Case Study: Multigenerational Attainment in 20th Century Wisconsin

3.1 Immigration History

Wisconsin had a very small population when it became a U.S. state in 1848. According to census data, population size was 3,635 in 1830 (excluding the indigenous population; Gara 1962). By 1900, massive immigration from Europe meant that the population had grown to over two million (Nesbit 1989), with the share of the population that was born outside the U.S. averaging one third of the total population. The main immigrant groups from Europe were Germans and Norwegians, which together comprised more than half of the foreign-born population in the period 1870-1900 (Gara 1962). Other major immigrant groups include Poles, Canadians, Swedes, and Irish. We focus on German and Norwegian immigrants because they were the largest and most influential immigrant groups in Wisconsin, settled in different parts of the state, and were instrumental in creating variation in local contexts.

3.2 Germans in Wisconsin

German immigrants arrived in two waves: 1830-1845 and 1855 onward. The first group, which was the first large immigrant group from Europe to settle in Wisconsin, consisted mainly of small landholders and artisans from Southern Germany (Smith 1929; Gara 1962; Nesbit 1989). This group brought considerable human capital and financial resources, and most were of Catholic faith. A second group arrived from 1855 onward. This group, which was mainly of Lutheran faith, emigrated from Eastern Germany and consisted principally of skilled farmers and peasants (Walker 1964). Germans in Wisconsin settled mostly in urban

areas and were financially prosperous in many sectors, including manufacturing (e.g., furniture making and brewing), wholesale (e.g., grocery), and personal services (e.g., medical and pharmaceutical professionals). In terms of their social and cultural characteristics, Germans sought to preserve their national heritage, including their language and customs, through institutions such as German language newspapers and sports and singing associations (Gara 1962). Moreover, as they found the local educational institutions to be poor, they imported teachers and textbooks from Germany and improved local schools (Petty 2013).

3.3 Norwegians in Wisconsin

Norwegians, most of whom arrived in the period 1860-1890, comprise the second-largest immigrant group in Wisconsin. By 1900, 25 percent of all Norwegians living in the US lived in Wisconsin, and most were farmers of Lutheran faith who, unlike the Germans, settled in rural areas (Fapso 2001). The Norwegians were on average poorer than the Germans, more religious and more nationalistic (Smith 1931). Despite having fewer financial means, most Norwegians were literate, and many prospered in sectors related to agriculture, for example livestock and grain farming, dairy and cheese, tobacco, and lumber (Nesbit 1989). Like the Germans, Norwegians relied on local institutions, in particular schools, to preserve their native culture and tongue.

3.4 Capturing Local Contexts

We now present six empirical indicators measured at the county level ($N \approx 70$). Our ambition is not to capture all characteristics of local contexts, but instead – and within the limitations imposed by relying on historical data and a limited sample of counties – to capture characteristics that are particularly relevant in the case of Wisconsin. We measure each county-level indicator at three points in time (around 1900, 1940, and 1960). We choose

these years because they capture variation in local contexts around the time the three generations whose socioeconomic attainment we study were born. Table 1 summarizes descriptive statistics (and Online Appendix A provides additional information).

– TABLE 1 HERE –

The first dimension of the local context we consider is economic context. We use two indicators to capture this dimension. The first indicator is a summary indicator of *economic development*. For the years 1900 and 1940, we use three variables from the Decennial Census: (1) the mean annual wages in USD per employee, (2) the average number of employees per manufacturing establishment, and (3) the mean value of annual products in USD in manufacturing establishments. For 1960, we use three similar indicators measuring (1) the mean annual wages in all industries in USD per employee, (2) the average number of employees per establishment in all industries, and (3) the share of the employed population aged 16 and over that works in manufacturing industries. Together, these variables capture between-county variation in wages, firm size, and economic output (Van den Berg 2017).³ As the three variables are highly correlated, we use Principal Component Analysis (PCA) to construct a single indicator that captures local variation in economic development. Given the

³ For each contextual variable presented here, we have considered alternative indicators also available in the Decennial Census (and in other historical sources). For example, as alternatives to the summary indicator of economic development, we considered country-level indicators of capital investments, bank deposits, number of manufacturing establishments, and the value of agricultural production. Moreover, as alternatives to the indicators of the share of the population that is Catholic and Lutheran presented below, we considered indicators capturing the number and value of church property and the total seating capacity in churches and edifices. In all cases, the alternative indicators were highly correlated with the indicators we use and added little information.

small number of counties, we recode these variables into deciles. The second indicator of economic context is a summary indicator of *urbanization*. We base this indicator on PCA of three indicators in the Decennial Census that are available for 1900, 1940, and 1960: (1) number of residents per square mile, (2) share of the population living in cities of 2,500 and over, and (3) share of population living in cities of 25,000 and over (Bloom et al. 2010). As with the indicator of economic development, we recode this indicator into deciles.

The second dimension of the local context we consider is social context. To capture this dimension, we construct two indicators measuring the share of the population in each county around 1900 and 1940 that was born in Germany and Norway, respectively (Berger & Engzell 2019). For 1960, we use information on the share of the population that was born in Germany/Norway, or whose parents were born in Germany/Norway. As stated earlier, we focus on Germans and Norwegians rather than on other immigrant groups because these two groups were the first, largest, and more geographically dispersed immigrant groups in Wisconsin. Consequently, local variation in the presence of each group is a proxy for the strength and institutionalization of the social characteristics of each group.

The third dimension of local context we consider is cultural context. We capture this dimension with two indicators measuring the share of the population around 1900, 1940, and 1960 that belongs to one of the two main religious denominations in Wisconsin: Catholicism and Lutheranism. We interpret religious denomination as a proxy for cultural context because religious denominations differ in characteristics traditionally associated with culture, for example values, ethics, and appropriate rules of conduct (Grant 2008).

We recognize that the indicators of social and cultural characteristics overlap to some extent, which means that we cannot distinguish clearly between the social and cultural dimension in the empirical analysis. In particular, the indicators of the share of

Germans and Norwegians might capture both social (e.g., local social networks) and cultural (e.g., language and customs) characteristics. We keep this fact in mind when interpreting the empirical results.

3.5 Expected Empirical Associations between Contexts and Socioeconomic Attainment

Our analytical model states that differences in local contexts manifest in different opportunity structures and different prospects of socioeconomic attainment. In this section, we motivate the expected direction of the association between each county-level variable and socioeconomic attainment.

Our first expectation is that the indicator of *economic development* is positively associated with individual socioeconomic attainment. We motivate this expectation from historical evidence that more economically developed local contexts exhibit larger and more specialized labor markets (e.g., in manufacturing and services), a higher demand for skilled labor, and local institutions that promote skills acquisition (e.g., vocational apprenticeships; Lindert & Williamson 1983; Knigge et al. 2014). Consequently, living in a more economically developed county should be associated with better prospects of socioeconomic attainment.

Our second expectation is that the indicator of *urbanization* is positively associated with socioeconomic attainment. We motivate this expectation from historical evidence that more densely populated contexts, for example towns and cities, have a higher supply of educational institutions and a higher demand for labor in manufacturing and services than less densely populated, and typically more rural, contexts (Boustan, Bunten, & Hearey 2018; Tselios 2014).

Our third expectation is that the indicators of the *share of Germans/Norwegians* are positively associated with socioeconomic attainment. We motivate these expectations

from historical evidence that, in addition to being financially industrious, German and Norwegian immigrants in Wisconsin often relied on social networks in economic transactions (Aldrich et al. 1985; Alexander 2007; Portes & Vickstrom 2011). Since we control for economic development and urbanization (i.e., economic characteristics), we expect the share of Germans/Norwegians to capture mainly social (and possible cultural) characteristics, for example the strength and types of social networks. Social networks may shape the opportunity structure in two ways. On the one hand, Germans/Norwegians may create strong social networks that benefit everyone, for example via innovation, information sharing, and high trust (i.e., *bridging* social capital; Putnam 2000). On the other hand, they may create social networks that favor “ethnic insiders,” i.e., individuals and families with German or Norwegian ancestry, and exclude others (i.e., *bonding* social capital; Borjas 1995). As explained below, we may address both scenarios in the empirical case study because we know the national ancestry of each individual and family in our data.

Our fourth expectation is that the indicator of the *share of Catholics* is negatively associated with socioeconomic attainment. We motivate the negative association from Catholic social doctrine, which emphasizes conservative family values and takes a critical stance towards capitalism (Nunn 2012). Conservative family values, in turn, might be associated with a weak entrepreneurial culture and low educational and occupational aspirations (Portes & Sensenbrenner 1993). The Catholic Church in Wisconsin has a long tradition of establishing schools (Steckel 1897; Nesbit 1989), which means that its social doctrine is likely to be more influential in local contexts with higher shares of Catholics.

Our fifth expectation is that the indicator of the *share of Lutherans* is positively associated with socioeconomic attainment. We motivate this expectation from Protestant social doctrine, which emphasizes individualism, hard work, and economic enterprise (Kahl 2005). The Lutheran Church in Wisconsin is theologically conservative and, like its Catholic

counterpart, it has a long tradition of establishing schools that proliferate its social doctrine (Nesbit 1989; Schroeder 2003).

The expectations we motivate above refer to associations between local context, opportunity structure, and socioeconomic attainment in the generation that is exposed to the context (i.e., the context pathway). However, by combining these expectations with assuming a positive association between (grand)parents' and (grand)children's socioeconomic attainment, and a positive association between characteristics of local contexts in the past and in the present (both expectations follow from existing research), we may infer about the expected direction of the two- and three-generation pathways in our model. Since we include six county-level variables, we do not describe all possible two- and three generation associations but use one example to illustrate the underlying logic. We expect a positive association between economic development and socioeconomic attainment in the first generation. As we also expect socioeconomic attainment in the first generation to be positively associated with attainment in the second generation, the combined expectation for the second generation is a positive Markov pathway. As we also expect a positive association between socioeconomic attainment in the second and third generation, the combined expectations are also positive for the multigenerational Markov and the second-order Markov pathways.

4. Individual-Level Data

4.1 WLS data

We use individual-level data from the Wisconsin Longitudinal Study (WLS). The WLS is a longitudinal study of 10,317 individuals born around 1939 who graduated from Wisconsin High Schools in 1957 (Herd, Carr, & Roan 2014). This group, which is the focal generation in the WLS, is the second generation (g2) in the context of our three-generation model. The

WLS also includes information on the parents (labeled g1 in our analysis) and the children of the focal generation (labeled g3).

We link each generation to a local context via information on county of birth and county of residence for g2 respondents. Specifically, for g2 respondents we have information on county of residence at birth and county of residence around age 18, 26, 30, 35 and 53/54. We link g2 respondents to a county of residence at around age 18 (i.e., in 1957) to capture the local contexts to which they were exposed during their formative years.⁴ As we know where g2 respondents lived, we also have information on where g3 respondents lived during their formative years (we use g2 county of residence in 1975, i.e., at around age 35 when g3 respondents were on average 12 years old, as our indicator of county of residence for g3 respondents). In the analysis of g3 socioeconomic attainment, we only include g3 respondents age 25 or older.

Determining county of residence is less straightforward for g1 respondents, as we do not know in which county they were born or where they lived during their formative years. All we know is where they lived when g2 respondents were born. To address this challenge, we use information on g1 county of residence when g2 respondents were born (i.e., around 1939) as our indicator of county of residence for g1 respondents. A limitation in this approach is that g1 respondents may not have lived in this county during their formative years or may have moved into this county shortly before the birth of the g2 respondent.

⁴ We recognize that the age at which we measure local context affects how we interpret the association between the contextual variables and socioeconomic attainment. For example, by choosing an earlier age we are more likely to capture how the opportunity structure links to skills formation (e.g., education), whereas by choosing a later age we are more likely to capture how the opportunity structure links to labor market outcomes (e.g., income and SES). We focus on adolescence because research on neighborhood effects suggests that context factors are particularly important at this age (e.g., Wodtke 2013; Wodtke, Elwert, & Harding 2016).

Although we cannot address this limitation directly, supplementary analyses presented in Online Appendix B suggest that most g1 respondents lived in the same county for extended periods.⁵

4.2 Indicators of Socioeconomic Attainment

We include three indicators of socioeconomic attainment: (1) educational attainment (years of completed schooling), (2) income, and (3) socioeconomic status (SES, measured by the Duncan Socioeconomic Index). The indicator of educational attainment is identical in all three generations, while the indicators of income and SES differ slightly. Table 2 presents descriptive statistics for all indicators.

– TABLE 2 HERE –

4.3 Control Variables

We include a range of socio-demographic control variables, including the national ancestry (German, Norwegian, other) and religious affiliation (Catholic, Lutheran, other) of each WLS family. Online Appendix A provides details.

4.4 Research Design

⁵ We know from that g1 mothers were on average 24.2 years old when their first child was born, while fathers were on average 27.9 years old. In Online Appendix B, we find that 86 percent of g2 respondents were born in the same county as their older sibling, which makes it reasonable to assume that most g1 respondents would be in their mid- to late-20s by the time we link them to a county of residence (and thus not too far removed from their formative years).

Our aim is to estimate empirical associations between local contexts and socioeconomic attainment in three generations. To do this, we use regression models to estimate (a) associations between the county-level indicators and socioeconomic attainment in each generation, (b) intergenerational associations in socioeconomic attainment, and (c) cross-time persistence in local contexts. Based on estimates from these models, we calculate measures that mirror each of the different pathways we outline in the analytical model. In addition to the main analyses we present below, we have carried out a series of robustness checks to address potential bias from residential mobility and sample selection (reported in Online Appendix B and C). Our substantive results do not change when we address these challenges to the extent possible with our data.

Our data consist of three-generation, individual-level data from the WLS merged with time-varying county-level data. In the following, i ($i=1, \dots, n$) indexes individuals and c ($c \approx 1, \dots, 70$) indexes counties (observed around 1900, 1940, and 1960). We begin by estimating a linear random effects model for socioeconomic attainment in the first generation

$$y_{ic,g1} = \mu_{g1} + \tilde{\gamma}_1 \mathbf{c}_{c,g1} + \boldsymbol{\beta}_1 \mathbf{x}_{ic,g1} + q_{c,g1} + \varepsilon_{ic,g1}, \quad (6)$$

where y is one of our indicators of socioeconomic attainment, μ_{g1} is a constant, \mathbf{c} is a vector of county-level variables (measured around 1900), \mathbf{x} is a vector of individual-level control variables in the first generation, q is a normally-distributed random effect that captures the influence of unobserved county-level variables, and ε is an idiosyncratic error term. Our main interest is $\tilde{\gamma}_1$, which is a vector capturing the associations between the six county-level variables and socioeconomic attainment in the first generation.

We estimate the following model for the second generation

$$y_{ic,g2} = \mu_{g2} + \tilde{\gamma}_2 \mathbf{c}_{c,g2} + \beta_2 \mathbf{x}_{ic,g2} + \tilde{\phi}_1 y_{i,g1} + q_{c,g2} + \varepsilon_{ic,g2}, \quad (7)$$

where $y_{i,g2}$ is socioeconomic attainment, \mathbf{c} is the vector of county-level variables (now measured around 1940), $y_{i,g1}$ is the attainment of the first generation, and the other explanatory variables are as explained above (though applying to a different generation). In this model, the main parameters of interest are $\tilde{\gamma}_2$ (a vector capturing the association between local context and g2 attainment) and $\tilde{\phi}_1$ (a vector capturing the association between g1 and g2 attainment).

We estimate the following model for the third generation

$$y_{ic,g3} = \mu_{g3} + \tilde{\gamma}_3 \mathbf{c}_{c,g3} + \beta_3 \mathbf{x}_{ic,g3} + \tilde{\phi}_2 y_{i,g2} + \tilde{\phi}_3 y_{i,g1} + q_{c,g3} + \varepsilon_{ic,g3}, \quad (8)$$

where $y_{i,g3}$ is socioeconomic attainment, \mathbf{c} is the vector of county-level variables (now measured around 1960), and the other explanatory variables are as above. In this model, the main parameters of interest are $\tilde{\gamma}_3$, $\tilde{\phi}_2$, and $\tilde{\phi}_3$.

Finally, we model how local contexts measured in the past generation correlate with local contexts in the present generation. To do this, we estimate the Ordinary Least Squares (OLS) regression models

$$\mathbf{c}_{c,g2} = \tilde{\delta}_1 \mathbf{c}_{c,g1} + \mathbf{v}_{g2}, \quad (9)$$

$$\mathbf{c}_{c,g3} = \tilde{\delta}_2 \mathbf{c}_{c,g2} + \mathbf{v}_{g3}, \quad (10)$$

where the $\bar{\delta}$ vectors summarize cross-time associations between local contexts, and v is an error term. We use empirical estimates of the key parameters in Equations 6-10, in combination with path analysis techniques, to calculate measures that mirror each of the different pathways through which our model links local contexts to socioeconomic attainment (as illustrated in Figure 1 and in Equation 5).⁶

5. Results

We organize the presentation of the empirical results into three sections. First, we present estimates of associations between the county-level variables and socioeconomic attainment in each generation. Second, we present estimates of cross-time associations in local contexts. Finally, we present results from analyses in which we calculate measures that mirror the pathways through which our model links local contexts to multigenerational socioeconomic attainment.

5.1 Socioeconomic Attainment in the First Generation

Table 3 summarizes estimates of associations between the county-level variables measured around 1900 and g1 socioeconomic attainment. First, we find that economic development is positively associated with family income and father's SES. Fully standardized estimates in brackets show that an increase in economic development of one standard deviation is associated with an increase in family income by 7.3 percent of a standard deviation and an increase in SES by 16.2 percent. These results are consistent with the idea that a more economically developed local context provides better prospects of socioeconomic attainment.

⁶ Path analysis is often implemented by estimating all regression models in a system simultaneously. This approach was not feasible due to limited sample sizes in each generation, the multilevel structure of the data, and the many dependent and explanatory variables.

Second, a higher level of urbanization is associated with higher g1 education (fathers and mothers) and with higher family income. This result fits the expectation that urban contexts offer better educational and economic opportunities.

Third, a higher share of respectively Germans and Norwegians is associated with higher education (fathers) and higher SES. Specifically, an increase of one standard deviation in the share of Germans (Norwegians) is associated with an increase in g1 (fathers') educational attainment of 5.4 (6.9) percent of a standard deviation. A possible explanation of the positive associations with education is that German and Norwegian immigrants improved local schools, which promoted educational opportunities for everyone. A possible explanation of the positive association with SES is that Germans and Norwegians established strong local networks, which enhanced local labor markets and employment opportunities. We hypothesized that the local social networks established by German and Norwegian immigrants might favor individuals and families with German or Norwegian ancestry. We explored this idea by including interaction terms between the share of Germans/Norwegians and g1 national ancestry in our models, but found no evidence that g1 families with German/Norwegian ancestry have higher socioeconomic attainment in counties with a higher share of Germans/Norwegians.

Fourth, a higher share of Catholics is negatively associated with educational attainment in g1 (fathers and mothers) but, surprisingly, positively associated with SES. A possible explanation of the negative association with education is that Catholic social doctrine, dominant in local contexts with a higher share of Catholics, discourages the pursuit of higher education. We also find that the share of Lutherans is unrelated to all indicators of g1 socioeconomic attainment.⁷

⁷ A possible explanation why we do not find any association between the share of Lutherans and socioeconomic attainment is that Lutheranism, although conservative theologically, is tied to only a few immigrant groups

– TABLE 3 HERE –

5.2 Socioeconomic Attainment in the Second and Third Generation

Table 4 summarizes estimates of associations between the county-level variables measured around 1940 and g2 socioeconomic attainment (controlling for g1 attainment and g2 controls). Here, only few associations between g2 local context and g2 attainment are statistically significant. We find a positive association between the share of Germans around 1940 and g2 SES (the fully standardized coefficient is 0.035, which is about half of the association we found between the share of Germans around 1900 and g1 SES, cf. Table 3). Overall, our results suggest that local context in g2 is only weakly associated with g2 socioeconomic attainment.

– TABLE 4 HERE –

Finally, we have analyzed the association between the county-level variables measured around 1960 and g3 socioeconomic attainment (controlling for g1 and g2 attainment). This analysis shows no statistically significant associations between g3 local context and g3 attainment (results available upon request).⁸

(mostly from Scandinavia), while Catholicism is shared by many immigrant groups (for example, from Germany, Ireland, and Southern and Eastern Europe). Because immigrant groups settled throughout Wisconsin, there is more cross-county variation in the share of Catholics than in the share of Lutherans.

⁸ A possible explanation of why the association between characteristics of local contexts and socioeconomic attainment are weaker in g2 and g3 than in g1 is that, over time, local contexts become more similar. However,

5.3 Cross-Time Persistence in Local Contexts

We also estimate cross-time persistence in local contexts. Table 5 summarizes results showing that, for all six county-level indicators, each county-level variable measured at the time when the previous generation was young is strongly and positively associated with the same variable measured at the time when the next generation was young. These results suggest that characteristics of local contexts persist over time.

– TABLE 5 HERE –

5.4 Total Associations and Direct and Indirect Pathways

We now use the empirical associations presented above to calculate measures that mirror each of the pathways we outline in our analytical model and summarize in Equation 5. As stated earlier, we do not interpret these measures as causal effects; instead, they serve to illustrate how we may use our model to describe different pathways through which local contexts link to socioeconomic attainment.

Table 6 and 7 summarizes main results. The numbers in the tables are fully standardized, i.e., they capture the change in the different measures of g2 and g3 socioeconomic attainment that is associated with an increase of one standard deviation in each county-level variable. The tables include a column labeled “total association” (TA), which summarizes the total (standardized) association between each county-level variable and the different indicators of g2 and g3 socioeconomic attainment. The total association is

the standard deviations of the contextual variables in each year (1900, 1940, and 1960; see Table 1) suggest that this is not the case.

the sum of the direct and indirect associations outlined in the analytical model and summarized in equation 5.

– TABLE 6 HERE –

Four noteworthy findings stand out when we inspect Table 6. The first is that the total association between the county-level variables and g2 socioeconomic attainment are statistically significant and in the expected direction in almost all cases. As expected, economic development and urbanization, and a higher share of Germans and Norwegians, are positively associated with all measures of g2 socioeconomic attainment. Furthermore, a higher share of Catholics is negatively associated with educational attainment, while a higher share of Lutherans is unrelated to g2 socioeconomic attainment.

The second finding is that, in most cases, almost all of the total association is attributable to the Markov pathway, i.e., local context in the first generation being positively associated with the attainment in the first generation, which in turn is positively associated with attainment in the second generation. The more complex total associations between the share of respectively Germans and Norwegians and g2 SES (which we discuss next) are the only exceptions to this pattern.

The third finding concerns the multiple pathways through which the shares of Germans (and Norwegians) are associated with g2 SES. Table 6 shows that the total association (0.039) is comprised from the share of Germans around 1940 (0.013; context pathway) and two pathways operating via the share of Germans around 1900 (0.022; past context pathway) and g1 attainment (0.004; Markov pathway). Stated differently, we observe g2 respondents with higher SES if, during their formative years, (1) they lived in a local context with a higher share of Germans [context pathway], (2) this local context historically

had a higher share of Germans [past context pathway], and (3) their parents lived in a local context with a higher share of Germans [Markov pathway]. These results illustrate different pathways through which local contexts might link to socioeconomic attainment. In this example, we calculate the Markov pathway by multiplying the (standardized) estimates from the regression of g1 socioeconomic attainment on the share of Germans in 1900 (Table 3) by the estimates from the regression of g2 SES on g1 socioeconomic attainment (estimates not shown).⁹ We calculate the past context pathway by multiplying the estimate from the regression of the share of Germans in 1940 on the share in 1900 (Table 5) by the estimate from the regression of g2 SES on the share of Germans in 1940 (Table 4); i.e., $0.616 * 0.035 = 0.022$. Finally, we calculate the context pathway by subtracting the past context pathway from the estimate of the regression of g2 SES on the share of Germans in 1940; i.e., $0.035 - 0.022 = 0.013$.

The fourth finding is that the total association between the county-level variables and socioeconomic attainment are smaller in the second generation than in the first generation (for comparison, Table 3 includes fully standardized coefficients for the first generation). This is unsurprising in light of our finding that the Markov pathway accounts for the lion's share of the total association and, thus, the association between contexts and attainment "dilutes" across generations.

Table 7 summarizes total associations, and their constituent components, in the third generation. In this table, we assess two and three-generation pathways, and three findings stand out. The first finding is that, as we also observed above, the total association between the county-level variables and g3 socioeconomic attainment are in the expected direction in almost all cases. This means that the substantive patterns of total associations (in

⁹ The calculation is: $0.059 * 0.076$ ([Germans₁₉₀₀ → g1 father's SES] * [g1 father's SES → g2 SES]) + $0.054 * 0$ ([Germans₁₉₀₀ → g1 father's education] * [g1 father's education → g2 SES, not statistically significant]) = 0.004.

terms of the signs on the coefficients of the county-level variables) are very similar to those we found in the first and the second generation.

The second finding is that most of the total association is comprised of pathways going through the attainment of the first and the second generation. For example, the total association between urbanization and g3 education is 0.020. This association is comprised from a multigenerational Markov pathway of urbanization around 1900 via the combination of g1 and g2 attainment (0.008), and a second-order Markov pathway via g1 attainment (0.012). Overall, these findings suggest that, at least in 20th century Wisconsin, the local contexts in which the first and second generation lived, but not the local contexts in which the third generation lived, are associated with socioeconomic attainment in the third generation.

The third finding is that the total associations between characteristics of local contexts and socioeconomic attainment are smaller in the third generation than in the first and second generation. Again, this result is unsurprising in light of our finding that most of the total associations link to pathways operating via ancestors up to two generations removed which “dilute” across generations.

– TABLE 7 HERE –

6. Discussion

In this paper, we argue that multigenerational research has focused too narrowly on transmission within the family and, by doing so, has failed to consider the local contexts in which socioeconomic attainment takes place. To broaden the perspective, we present an analytical model that explicates different pathways through which local contexts, and the local opportunity structures they create, shape socioeconomic attainment in three generations.

In addition to offering a broader analytical perspective, our model provides a framework for thinking about how variation in local contexts, and potentially exogenous shocks to these contexts, might be used to address causal hypotheses in multigenerational research.

We use a case study of 20th century Wisconsin to illustrate how we can use our model to interpret empirical associations between local contexts and multigenerational socioeconomic attainment. Our case study highlights different pathways that together make up the total association between local contexts and socioeconomic attainment. For example, the second generation has higher SES if the local context in which it lived during its formative years had a higher share of Germans (context pathway), this local context historically had a higher share of Germans (past context pathway), and the local context in which parents lived had a higher share of Germans (Markov pathway). In addition, we may attribute some of the total association between local contexts and SES in the third generation to the local contexts in which the first generation lived (via the multigenerational and second-order Markov pathways).

While our model provides a starting point for linking local contexts to multigenerational socioeconomic attainment, we could extend it in several ways to make it more flexible and realistic.

First, the way in which we link local contexts to the opportunity structure is rather simplistic. Instead of assuming that local contexts are “one thing,” we could allow them to be multidimensional and to have heterogeneous effects on socioeconomic attainment. For example, research on neighborhood effects highlights economic opportunity, socialization, and peer effects as plausible mechanisms through which the local opportunity structure might affect socioeconomic attainment (Sharkey & Faber 2014; Chetty & Hendren 2018a, 2018b). It would be straightforward to accommodate multiple dimensions of local

contexts in our model, each with a separate effect on socioeconomic attainment in each generation.

Second, research suggests that the age at which individuals are exposed to the local opportunity structure affects socioeconomic attainment (Wodtke 2013; Hedman et al. 2015; Levy 2019). In our model, we could allow for the effect of local contexts on socioeconomic attainment to vary by age at first exposure. For example, it might be that local contexts are more important early rather than late in life, or that specific historical circumstances mean that age at exposure has a different impact in each generation.

Third, we could include additional pathways in the model. For example, we assume that local contexts operate “outside the family” with a one-generation lag (cf. equation 4): i.e., characteristics of local contexts in the current generation depend on what the local context was like one (but not two) generation(s) ago (we do allow for local contexts to operate with a two-generation lag “inside the family” via the multigenerational and second-order Markov pathways). However, we might be interested in non-Markov context pathways in which characteristics of local contexts two generations ago directly affect local contexts in the current generation. This extension might be relevant for analyzing long-term persistence in local institutions not captured by a traditional Markov process (Nunn 2012; Alesina and Giuliano 2015). Moreover, we might be interested in a direct pathway from local context in the previous generation to socioeconomic attainment in the current generation (i.e., $c_{g2} \rightarrow y_{g3}$). For example, in the case of the Cultural Revolution in China (Xie and Zhang 2019) this pathway might be relevant because, in addition to affecting the generation exposed it, the revolution brought about changes (economic, social, and cultural) that arguably shaped the opportunity structure and socioeconomic attainment in the next generation directly. These examples illustrate how, depending on the research question and empirical context, our model is flexible in terms of how we can apply it.

Fourth, our model assumes that the effect of local context on socioeconomic attainment is additive and thus independent of individual and family characteristics. However, it might be that some individuals and families are more vulnerable to unfavorable contexts than others are, or are better able to exploit favorable contexts. We could address this scenario by including interactions between different indicators of local context or between local context and individual/family characteristics. In our case study of Wisconsin, we did this by analyzing if families with German (Norwegian) ancestry have an “insider advantage” in local contexts with a higher share of German (Norwegian) immigrants.

We end the paper by addressing the how we could use our model as a framework for addressing causal hypotheses in multigenerational research. As we state in the introduction, multigenerational research faces difficulties in identifying causal effects of ancestors’ attainment on descendants’ attainment (Lawrence & Breen 2016; Breen 2018; Engzell, Mood & Jonsson 2020). We believe our model could be used to frame and test causal hypotheses. One approach, which we mentioned in the introduction, is to find a “natural experiment” that affects socioeconomic attainment in the generation exposed to it. If this natural experiment is unrelated to other characteristics that affect socioeconomic attainment in later generations, we could use it to identify the causal effect of ancestors’ attainment on descendants’ attainment. In the terminology of our model, we would use exogenous variation in local contexts in a first step to estimate the causal effect of the local context on socioeconomic attainment in the first generation (i.e., the context pathway). In a second step, we would use this estimate to identify the two- and three-generation pathways described in Equation 5. We are not aware of any research that has used this type of approach in a three-generation setting. However, in a two-generation setting research has used variation across local contexts in the incidence of, for example, the 1918-1919 influenza pandemic (Almond 2006) and famines (Painter et al. 2008; Lindeboom et al. 2010) to estimate what we

label the Markov pathway. In our case study of Wisconsin, members of the first generation entered the labor market around the time of the Great Depression, which began in October of 1929. Since the economic and social fallout of the Great Depression varied across Wisconsin (in particular, rural areas were hit harder than urban ones; Gara 1962), we might, provided appropriate data, use this event as a natural experiment that affected the local contexts to which the first generation was exposed to address causal hypotheses. We leave this ambition for future work.

7. References

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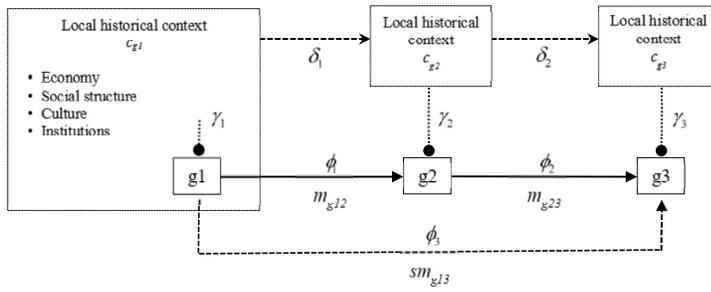
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FIGURES

Figure 1. Analytical Model



TABLES

Table 1. Summary Statistics for County-Level Variables

	Mean	SD	Min	Max	Unit
1900					
1 Economic development	5.50	2.89	1	10	Decile
2 Urbanization	5.50	2.89	1	10	Decile
3 Germans	10.17	5.61	1.31	23.78	Share
4 Norwegians	3.54	3.67	0.05	16.74	Share
5 Catholics	22.74	13.15	1.74	75.79	Share
6 Lutherans	13.33	7.10	0.94	30.99	Share
1940					
1 Economic development	5.44	2.92	1	10	Decile
2 Urbanization	5.44	2.92	1	10	Decile
3 Germans	2.14	1.14	0.45	4.80	Share
4 Norwegians	0.93	0.93	0.02	3.57	Share
5 Catholics	21.36	11.29	3.54	54.49	Share
6 Lutherans	16.93	9.66	3.66	45.52	Share
1960					
1 Economic development	5.44	2.90	1	10	Decile
2 Urbanization	5.50	2.89	1	10	Decile
3 Germans	7.50	3.22	2.42	16.31	Share
4 Norwegians	2.69	2.70	0.26	13.46	Share
5 Catholics	26.36	13.60	6.00	64.34	Share
6 Lutherans	22.78	11.26	4.59	55.00	Share

Note: $N \approx 70$. See Online Appendix A for more information.

Table 2. Summary Statistics For Individual-Level WLS Data

	Mean	SD	Min	Max	N
<i>First generation</i>					
Father's Education	9.62	3.26	0	25	4,467
Mother's Education	10.42	2.71	0	20	4,467
Family income	63.34	56.39	3	998	4,467
Father's SES	32.15	20.57	3.5	96	4,467
<i>Second generation</i>					
Education	13.53	2.24	12	20	6,504
Earnings	106.26	107.63	0	1650	6,504
SES	48.63	23.03	3	96	6,504
<i>Third generation*</i>					
Education	14.05	2.14	10	24	1,800
Income Score	274.48	221.40	0	877	1,800
SES	46.99	23.23	4.1	96	1,800

Note: * Includes respondents age 25 and older in 2004.

Table 3. Summary of Random Effects Regressions of g1 Socioeconomic Attainment on Local Context. Parameter Estimates, Standard Errors in Parentheses and Fully Standardized Estimates in Brackets

1900 Context	Father's education	Mother's education	Family Income	Father's SES
Economic development	0.019 (0.035)	-0.006 (0.042)	1.527* (0.584) [0.073]	1.192*** (0.188) [0.162]
Urbanization	0.196*** (0.032) [0.167]	0.094* (0.038) [0.097]	1.546** (0.539) [0.074]	0.158 (0.173)
Germans	0.033* (0.016) [0.054]	-0.026 (0.024)	0.394 (0.261)	0.225** (0.084) [0.059]
Norwegians	0.064* (0.026) [0.069]	0.018 (0.036)	-0.082 (0.431)	0.237† (0.139) [0.041]
Catholics	-0.016** (0.005) [-0.062]	-0.016* (0.007) [-0.076]	0.115 (0.085)	0.067* (0.027) [0.041]
Lutherans	-0.016 (0.013)	-0.005 (0.017)	-0.008 (0.211)	0.066 (0.068)
<i>N</i>	4,467	4,467	4,467	4,467

Note: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (Two tailed tests), g1 control variables in all models: family religion and national ancestry. Extra controls in model of father/mother's education: year of birth. Extra controls in models of family income and father's SES: father's year of birth, family size, and father and mother's educational attainment.

Table 4. Summary of Random Effects Regressions of g2 Socioeconomic Attainment on Local Context. Parameter Estimates, Standard Errors in Parentheses and Fully Standardized Estimates in Brackets

1940 Context	Education	Earnings	SES
Economic development	-0.026 (0.021)	0.843 (0.012)	0.239 (0.175)
Urbanization	0.020 (0.022)	-0.278 (0.860)	0.235 (0.186)
Germans	0.020 (0.043)	1.888 (1.270)	0.716** (0.274)
Norwegians	0.069 (0.054)	1.167 (1.912)	0.738† (0.413)
Catholics	-0.003 (0.004)	0.032 (0.138)	0.008 (0.030)
Lutherans	-0.003 (0.004)	-0.025 (0.150)	0.017 (0.032)
<i>N</i>	6,504	6,504	6,504

Note: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (Two tailed tests), g2 control variables in all models: IQ, sex, year of birth; g1 control variables in all models: family size, family religion, and national ancestry. Extra control variables in model of education: g1 father and mother's education, g1 family income, and g1 father's SES. Extra control variables in models of earnings and SES: g2 education, g2 family size, g1 father and mother's education, g1 family income, and g1 father's SES.

Table 5. Results from OLS Regressions of Long-Term Persistence in Local Contexts. Parameter Estimates, Standard Errors in Parentheses and Fully Standardized Estimates in Brackets

Year	1940						1960					
	Econ. Dev.	Urb.	Ger.	Nor.	Cath.	Luth.	Econ. Dev.	Urb.	Ger.	Nor.	Cath.	Luth.
Economic development	0.410*** (0.104) [0.406]	0.110 (0.079)	0.108** (0.033) [0.274]	0.033 [†] (0.017) [0.101]	-1.177** (0.412) [-0.302]	-0.102 (0.271)	0.467*** (0.096) [0.470]	0.145 (0.121)	0.021 (0.068)	-0.023 (0.057)	0.744** (0.248) [0.160]	-0.260 (0.209)
Urbanization	0.508*** (0.092) [0.503]	0.794*** (0.070) [0.787]	0.002 (0.029)	0.015 (0.015)	0.455 (0.365)	0.204 (0.240)	0.161 (0.098)	0.611*** (0.124) [0.617]	-0.141* (0.070) [-0.128]	-0.042 (0.059)	-0.341 (0.254)	0.238 (0.214)
Germans	-0.039 (0.068)	0.053 (0.052)	0.125*** (0.022) [0.616]	-0.022* (0.011) [-0.135]	0.819** (0.271) [0.407]	0.487** (0.178) [0.283]	0.568* (0.243) [0.223]	-0.313 (0.306)	2.416*** (0.174) [0.857]	-0.317* (0.145) [-0.314]	-0.763 (0.630)	1.029 [†] (0.531) [0.104]
Norwegians	-0.156 (0.097)	-0.018 (0.074)	-0.071* (0.031) [-0.228]	0.220*** (0.016) [0.866]	0.687 [†] (0.387) [0.223]	0.324 (0.255)	-0.420 (0.269)	-0.248 (0.340)	-0.326 [†] (0.192) [-0.094]	2.372*** (0.160) [0.818]	-1.142 (0.696)	2.160*** (0.587) [0.179]
Catholics	0.014 (0.019)	0.002 (0.014)	-0.014* (0.006) [-0.165]	-0.003 (0.003)	0.598*** (0.075) [0.696]	-0.117* (0.049) [-0.160]	0.047* (0.019) [0.181]	0.032 (0.024)	-0.002 (0.013)	-0.008 (0.011)	1.109*** (0.049) [0.921]	-0.014 (0.041)
Lutherans	0.061 (0.044)	-0.008 (0.034)	0.030* (0.014) [0.187]	0.006 (0.007)	-0.637*** (0.176) [-0.401]	0.954*** (0.116) [0.702]	0.055* (0.023) [0.184]	0.078** (0.029) [0.260]	0.060*** (0.016) [0.181]	0.046** (0.014) [0.165]	0.043 (0.060)	1.023*** (0.050) [0.877]
<i>N</i>	70	70	70	70	70	70	71	70 ^a	71	71	71	71
<i>R</i> ²	0.644	0.795	0.758	0.907	0.623	0.774	0.749	0.604	0.896	0.898	0.924	0.921

Note: [†] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (Two tailed tests), ^a Census data on Adams County is missing in 1960.

Table 6. Decomposition of Pathways Through Which Local Context Is Linked to g2 Socioeconomic Attainment

	Education				Earnings				SES			
	TA	CP	PCP	MP	TA	CP	PCP	MP	TA	CP	PCP	MP
Economic development	0.025	-	-	0.024	0.005	-	-	0.005	0.012	-	-	0.012
Urbanization	0.031	-	-	0.031	-	-	-	-	-	-	-	-
Germans	0.012	-	-	0.012	0.002	-	-	0.002	0.039	0.013	0.022	0.004
Norwegians	0.012	-	-	0.012	0.001	-	-	0.001	0.033	0.004	0.026	0.003
Catholics	-0.007	-	-	-0.007	0.001	-	-	0.001	0.003	-	-	0.003
Lutherans	-	-	-	-	-	-	-	-	-	-	-	-

Note: TA = Total association; CP = Context pathway ($\gamma_2 c_{g2}$); PCP = Past context pathway ($\gamma_2 [\delta_1 c_{g1}]$); MP = Markov Pathway ($[\phi_1 \gamma_1] c_{g1}$). Table only includes coefficients significant at $p < 0.10$ or better.

Table 7. Decomposition of Pathways Through Which Local Context Is Linked to g3 Socioeconomic Attainment

	Education						Income score					
	TA	CP	PCP	MP	MMP	SOMP	TA	CP	PCP	MP	MMP	SOMP
Economic development	0.006	-	-	-	0.006	-	0.001	-	-	-	0.001	-
Urbanization	0.020	-	-	-	0.008	0.012	0.092	0.035	0.057	-	-	-
Germans	0.007	-	-	-	0.003	0.004	0.002	-	-	0.002	0.0004	-
Norwegians	0.008	-	-	-	0.003	0.005	0.002	-	-	0.002	0.0003	-
Catholics	-0.006	-	-	-	-0.002	-0.004	0.0003	-	-	-	0.0003	-
Lutherans	-	-	-	-	-	-	-	-	-	-	-	-
	SES											
	TA	CP	PCP	MP	MMP	SOMP						
Economic development	0.010	-	-	-	0.0005	0.009						
Urbanization	0.002	-	-	-	-	0.002						
Germans	0.003	-	-	0.001	0.0002	0.002						
Norwegians	0.003	-	-	0.001	0.0001	0.002						
Catholics	0.002	-	-	-	0.0001	0.002						
Lutherans	-	-	-	-	-	-						

Note: TA = Total association; CP = Context pathway ($\gamma_3 c_{g3}$); PCP = Past context pathway ($\gamma_3 [\delta_2 c_{g2}]$); MP = Markov pathway ($[\phi_2 \gamma_2] c_{g2}$); MMP = Multigenerational Markov pathway ($[\phi_2 \phi_1 \gamma_1] c_{g1}$); SOMP = Second-order Markov pathway ($[\phi_3 \gamma_1] c_{g1}$). All models include controls. Table only includes coefficients significant at $p < 0.10$ or better.