The persistently high fertility of a North American population: A 25-year restudy of parity among the Ohio Amish

Samson Wasao[1], **Cory Anderson**[2], **Christian Mpody**[3]

[1]Independent Consultant

[2]The Pennsylvania State University

[3]The Ohio State University

Abstract

Why do the North American Amish maintain high fertility when surrounding populations have nearly all completed the demographic transition? Using the same theoretical predictors and methods as a 1996 *Population Studies* paper, we explore fertility changes, specifically changes in mean parity, between 1988 and 2015 among one sizeable Amish population in Ohio. Findings suggest that wealth flow shifts (as measured by a decline in farming families) and institutional changes (reflected in Amish denominational gradations) help to explain a decline in mean parity from 5.3 to 4.85, while ideological pronatalism (represented by higher fertility among church leaders) helps to explain why fertility has not been more responsive to structural incentives to limit family size. While this restudy confirms the trend of a slow decline in Amish fertility, it also invites a more methodologically expansive inquiry into Amish fertility patterns.

Keywords

demographic transition theory; high fertility; population change; agrarianism; Anabaptist; New Order Amish; Andy Weaver Amish; religion and fertility; ethnicity and fertility; Christianity and fertility

Introduction

The North American Amish, an ethnically Swiss-German population in the Anabaptist Christian religious tradition (Anderson 2020), represent a conspicuous exception to the West's demographic transition. While Amish mortality rates dropped in tandem with those of North America's populations throughout the twentieth century (Smith 1960; Hewner 1998; Mitchell et al. 2001), studies have consistently reported completed fertility of anywhere between six and eight children per Amish woman (Colyer et al. 2017).

In this Western context, the Amish provide an exceptional opportunity to test theories of fertility change. In a 25-year-old *Population Studies* paper, Wasao and Donnermeyer (1996)—following other Amish-themed research (e.g. Ericksen et al. 1980)—argued that

rapid population growth would eventually drive a land scarcity for these agrarian people, forcing social changes that should reduce fertility—barring sudden increases in decrement processes, such as outmigration and defection from the community. This proposition follows the wealth flow theory, which predicts that when intergenerational wealth flows between parents and children become an overwhelming expense to parents, the rational response of parents will be to limit family size (Easterlin 1975; Caldwell 1976). Due to land pressure arising from natural growth, as Amish move out of agricultural occupations—where children are an asset—and into wage, industrial, and professional occupations as a response to land pressure, children will provide little return to parents and parents will limit fertility.

Additionally, we would expect fertility to decline as Amish social institutions adapt to wider structural changes in North America. While Amish institutions support pronatalist behaviour (Blume 2010; Jolly 2017; Anderson and Potts 2020), North American institutions consistently provide conditions for lower fertility. These institutions represent decision-making contexts for individuals, providing opportunities and constraints, roles and status, networks, the diffusion of ideas/practices, economic and technological organization, and sanctions (Heaton 1986; Watkins 1991; Crenshaw et al. 2000; Lutz 2017). However, high fertility may persist, even alongside rational utility and institutional pull factors, when an old moral order favours high fertility. So long as the Amish maintain ideationally pronatalist orientations, and opinion leaders exercise influence on congregants' fertility behaviours, fertility rates may not decline as rapidly as with other North American populations (Lesthaeghe 1983; Heaton 1986; Vaisey 2007).

Wasao and Donnermeyer (1996) tested these three theoretical explanations of fertility— wealth flows, institutionalism, and ideationalism—with a data sample compiled from the *Ohio Amish Directory*: specifically, the edition covering the Holmes County, Ohio, United States (US) area and in-state offshoot settlements (Gingerich 1988). The *Directory* is an unrivalled source of demographic data about the Amish. Representatives from each church submit updated information to the publisher, and the directory includes household members' names and immediate relations; birth, death, marriage, and remarriage dates; street addresses; and select social variables including the household head's occupation and ministerial status (Colyer et al. 2017). (Remarriage is permissible only if a spouse dies; divorce is forbidden, although separation is occasionally tolerated.) Detailed editions of the *Directory* were first available in the 1960s, when geneticists from Johns Hopkins University worked with the Amish to compile population records (Cross and McKusick 1970), but since then have been solely Amish-published.

The *Directory* includes both the behemoth 'Greater Holmes County' settlement area— which geographically spills into surrounding counties, including Wayne, Tuscarawas, and Coshocton—and several in-state offshoot communities. The Holmes settlement is among the largest and oldest, and hence is ideal for testing population theories. The community is under land development pressure, is experiencing occupational transitions (Nethers 1983; Lowery and Noble 2000; Donnermeyer and Anderson 2017), and includes the gamut of the Amish population's ideological gradations (Petrovich 2017).

Wasao and Donnermeyer (1996) used the latest *Directory* edition available at that time—the 1988 edition, which included 3,647 households—to develop period-based variables. They cluster sampled households from every fifth church, producing a sample of 888 households from 28 churches (24.3 per cent of all households). The dependent variable was a married couple's parity, that is, the total number of children listed.

Three independent predictor variables were used to test the three theories. For wealth flow theory, Wasao and Donnermeyer (1996) investigated each household head's listed occupation. As occupation is asked as an open-ended question, actual listed occupations vary greatly. However, a useful distinction for wealth flows is between farming and all other occupations. By coding households as farmer or non-farmer, Wasao and Donnermeyer predicted that farming families would report a higher mean parity.

To test the predictions of institutional theory, Wasao and Donnermeyer (1996) analysed Amish religious denominations. Denominations are central institutional contexts that influence individual decision-making. The six 'Old' Amish denominations (in contrast to the liturgically evangelical and technologically permissive Amish Mennonites) follow an ordinal scale regarding relative strictness of discipline, technology, beliefs, and community practices (Anderson 2013; Petrovich 2017). Three Old Amish denominations have sizeable representation in the *Directory*: the New Order, Old Order, and Andy Weaver churches, listed in order from the least strict to the strictest, which should in turn predict the lowest to highest mean parities. (A fourth denomination, the Swartzentruber Amish, is the strictest; they do not participate in the *Directory* so cannot be analysed with this source.) The three denominations we analyse developed in the 1950s and 1960s when a three-way schism occurred: the New Order group sought evangelically oriented renewal and technological change; the Andy Weaver group sought clearer ecclesiastical regimentation and technological restrictions; and the Old Order community—the largest group and default denomination—sought an in-between path representing institutional continuity (Anderson 2019a). Wasao and Donnermeyer predicted that parity levels would parallel each denomination's relative institutional flexibility.

To investigate the presence of an 'old moral leadership' (representing the importance of ideational factors), Wasao and Donnermeyer (1996) compared the mean parity of ordained men—as conspicuous opinion leaders—with that of laymen. They predicted that Amish leaders would exemplify the presence of an old moral order to the extent that they would maintain higher fertility rates than laity. Local Amish churches consist of usually no more than 40 families and four or five leaders. To select new leaders, the church holds a special ceremony, wherein members nominate potential candidates, usually mid-life adult married men who exemplify the group's values. Other ordained men interview those nominated to ensure orthodoxy. Finally, all approved nominees draw lots to decide who will join the plural leadership (Scott 1988). Hence, leaders are often the ones who represent cautiousness towards changes relative to that church's laity, although leader ideology varies from church to church (Anderson 2019a). Leaders are also socially proximate enough to laity to deliver primary socialization.

Descriptive statistics from Wasao and Donnermeyer (1996) revealed that mean parity among Amish farming families was 6.2 children compared with 4.7 among non-farming families; New Order households had a mean parity of 4.8, Old Orders 5.2, and Andy Weavers 6.3; and mean parity was higher in families headed by the three ranks of ordained leaders than in laity families, at 6.3–7.2 vs. 5.0 respectively. These findings supported their hypotheses. Additional support came from logistic regression analyses of the three predictor variables —farmer vs. non-farmer status of the household head, denominational affiliation as New Order, Old Order, or Andy Weaver, and household head as church leader or layman—and two control variables (women's age at first marriage and marriage duration). From the descriptive statistics and logistic regression analysis together, Wasao and Donnermeyer concluded that the Amish had begun a fertility decline, represented by the gradual transition towards non-farming occupations coupled with the lower mean parity of non-farming households, the lower mean parity among less strict Amish denominations, and the lower mean parity among laity compared with leaders.

Now a quarter of a century later, we see several reasons to conduct a restudy with updated data. First, following demographic transition theory, the 1996 study argued that the Amish were beginning a fertility decline. However, the period data used were but a snapshot, so temporal claims, although offered then, seem hazardous in retrospect. Indeed, contrary to Wasao and Donnermeyer's (1996) assertion that fertility was on a gradual decline, Colyer et al. (2017) found remarkable stability in median household size up to the 2000 edition of the *Directory*. By conducting a restudy, we are better prepared to comment on fertility changes. Second, Colyer et al. (2017) also recently found a gradual decline in median household size beginning in 2000. However, the data set they used—the 'McKune Data', which were based on multiple editions of the Holmes County *Directory* (available at the Association of Religion Data Archives website (McKune 2020))—could provide only tentative results due to the prevalence of data set errors. Nevertheless, this *potential* decline invites a follow-up investigation using reliable data. Third, in 1996, the three affiliations seemed to represent a continuum of change, where New Orders were the most responsive to structural adaptation while the Andy Weaver group was the least responsive, with Old Orders in between. Today, this continuum is not so clear, especially in the differences between New Orders and Old Orders. Fourth, an assertion in the discussion about Amish leaders in the 1996 study raised an intriguing question. Namely, were higher parities among leadership evidence of an old moral order that kept overall fertility high (p. 239) or were lower parities among laity signs that fertility was on the decline (p. 245)? This question requires further investigation.

In this update, we closely follow Wasao and Donnermeyer's (1996) theoretical foundations and methods. We analyse the same communities with the same propositions and the same predictor and control variables but at a different time (2015 vs. 1988 data). However, with regard to Wasao and Donnermeyer's (1996) third theoretical proposition, we predict that church leaders will have higher fertility than laity because church leaders are the closest to Amish religious and cultural values and are more likely to exemplify these values. If pronatalism is an Amish value, then leaders will have higher fertility. Ideological pronatalism could temper the effect of structural changes that would otherwise result in fertility declines. We construe any differences in fertility between ordained leaders and laymen as evidence of an ideological pronatalism buffering overall Amish fertility against

decline, *not* as evidence of fertility decline with laity leading the decline (Anderson and Potts 2020).

Method

Both this and the original study (Wasao and Donnermeyer 1996) used the Holmes County version of the *Ohio Amish Directory* (for a detailed evaluation of Amish directories as data sources, see Colyer et al. 2017). In this restudy, we took advantage of a full data set and conducted a census-level analysis of *all* households from the 2015 edition (Wengerd 2014), whereas 25 years ago Wasao and Donnermeyer cluster sampled households from one in five churches in the 1988 edition. Hence, this paper expands, retests, and re-examines the original analyses, but is not a pure methodological replication.

To develop our database from the 2015 *Directory*, Cory Anderson (one of the authors of this paper) coordinated 19 undergraduate assistants from Truman State University's Sociology and Anthropology department in manually entering data from the print source *Directory* into a Microsoft Excel file. Two undergraduate students cleaned the data using logical formulas that detected numerical values outside acceptable ranges. We then converted the data set into the SAS/STATA format for analysis. We began with 5,807 households, then excluded 472 households containing just one person who had never married; we refer to households where a marriage exists or had existed as a 'family', in contrast to households with a single never-married occupant. In families with a remarried widow or widower, we only counted children from first marriages and based duration of marriage and age of the wife on the first marriage only.

We developed our variables as follows:

1. We used parity—the sum of a mother's live births at any given time point (Haub 2003)—as the dependent variable.

2. We coded the family head's occupation as either farmer or non-farmer. Examples of non-farming occupations include roofing, construction, and employment at Maple Valley Fence, among many other trades and business entities.

3. Because the *Directory* does not label churches by Amish denomination, we conferred with a local Amish informant to verify each church's denomination, then assigned labelled households as Andy Weaver, Old Order, or New Order, based on local church membership. This affiliation scheme aligns with Petrovich's (2017) important contribution to conceptualizing Amish denominations with one exception: while he distinguished between New Order and 'New New' Order (a progressive division from the New Order), we combined them for the sake of consistency with the earlier Wasao and Donnermeyer study.

4. We identified leaders as any man listed as a church's bishop, minister, or deacon; all others were coded as laymen.

5. For control variables, we used family lists of birth dates and marriage dates to calculate the age of wives at first marriage and duration of marriage. The control

variables aimed to remove the effects of different age and marital structures of the different groups analysed, as well as effects of changes over time in these variables.

Results

Descriptive analysis

Table 1 provides characteristics of families listed in the 2015 *Directory*. Nearly 16 per cent of male family heads who gave their occupation were farmers, with the remainder in non-farming occupations. In terms of affiliation, about 19 per cent of families belonged to the Andy Weaver denomination, about 10 per cent were members of the New Order, and the remaining 71 per cent were Old Order. By church leadership status, 16 per cent of male family heads were ordained, with the remainder being laymen.

Table 2 presents descriptive results for parity. Our 'census' tallied 28,167 live births in 5,807 families (Table 2(a)), with an average parity of 4.85 per family in 2015 (Table 2(b)). The 1988 *Directory* study calculated an average parity of 5.3, suggesting a parity decline of 0.45 from 1988 to 2015. We turn now to parity by each of the three predictor variables.

Do changes in parent–child wealth flows, as represented by occupational transitions, impact fertility? In 2015, the mean parity of farming households was 5.95, compared with 4.45 for non-farming households, which confirms our prediction. However, parity declined equally (by 0.25) for both occupation categories from 1988 to 2015: from 6.2 to 5.95 for farming households and 4.7 to 4.45 for non-farming households. Mean parity was highest (6.21) for families with missing occupational values; this probably captures a disproportionate number of older family heads who have retired from the workforce.

Does parity follow the relative strictness of each of the three major religious institutional settings? While mean parity in the strictest group, Andy Weaver, was 5.43 in 2015, Old Order parity was now below New Order parity. Contrary to our predictions, parity was 0.38 *higher* for New Order families than Old Order families in 2015, whereas in 1988 New Order parity was 0.40 *lower* than that of Old Order. What about parity changes within the three groups? Andy Weaver families experienced the steepest decline between 1988 and 2015, as mean parity fell by nearly one birth, from 6.3 to 5.43—a 13.8 per cent decrease. For Old Order households, mean parity declined from 5.2 to 4.66—a 10.4 per cent decrease. However, among New Order families, mean parity increased from 4.8 to 5.04—a 5.0 per cent increase.

Does an ideological pronatalism persist among the Amish, as represented by a higher mean parity among ordained leaders? Mean parity for families of ordained men was higher than for laymen in both studies, by 1.64 in 1988 and 1.72 in 2015. However, both statuses experienced parity declines, for ordained men from 6.83 to 6.29—a 7.9 per cent decrease— and for non-ordained men from 5.0 to 4.57—an 8.6 per cent decrease.

Logistic regression analysis

In Tables 3 to 6, we present the results from maximum likelihood estimates of the logistic regression analyses. We adopted the same models as the 1996 study, using four categories of family size as the dependent variable, with the same three independent variables of interest for the univariate models. The multivariate models were adjusted for the same two control variables as the previous analysis, namely, marriage duration and the age of the wife at marriage. We estimated the unadjusted and adjusted odds ratios (OR and aOR, respectively) and their 95 per cent confidence intervals (CIs).

In the adjusted models, the odds of having 0–2 children (Table 3) are 2.12 times higher for non-farming households (95 per cent CI 1.65–2.73) than farming households. In terms of church affiliation, Andy Weaver families (aOR 0.71; CI 0.59– 0.86), are less likely to report a parity of 0–2 when compared with the reference group (Old Order families) and so are the New Order families (aOR 0.89; CI 0.67–1.19).when compared with the reference group. For the leadership variable, Table 3 shows that laymen families are nearly twice as likely to report parities of 0–2 compared with church leader families (aOR 1.90; CI 1.41–2.57).

Table 4 has similar results to Table 3 for parities 0–5, showing that parity less than the overall mean is more likely associated with similar dependent variables, while for Tables 5 and 6, opposite patterns exist: mean parities are higher among farm families, families belonging to stricter denominations, and families whose men are ordained, after controlling for age of wives at marriage and marriage duration.

Discussion

In this restudy of Ohio Amish parity, we have presented new results a generation after Wasao and Donnermeyer's (1996) benchmark study, allowing us to gauge changes between 1988 and 2015. Perhaps no other result stands out more than the sheer persistence of high fertility among the Amish in the low-fertility context of North America, despite our detecting a minor decline. This validates and extends studies of Amish fertility in other times and places: twentieth century Amish fertility has remained basically stable, with only slight increases (Cross and McKusick 1970; Ericksen et al. 1979) and decreases (Dorsten 1999; Greksa 2002). No permanent Amish fertility transition mirroring that of the West is yet evident—although we wonder if we are seeing the beginning of such a transition (Colyer et al. 2017).

Why has high fertility persisted? We identified three theories our data set could measure. Wealth flow theory argues that couples rationally reduce fertility when children's utility declines and cost increases. We represented wealth flows using farming vs. non-farming occupations, confirming the earlier finding that Amish fertility is responsive to wealth flows, as mean parity is lower among non-farmers. However, farmers and non-farmers both experienced parallel parity declines between 1988 and 2015, suggesting that while the Amish are responsive to wealth flows, other structural factors also impact their fertility.

Those structural factors may be represented by Amish denominations (institutions), where parity changes have been much more uneven. While Andy Weaver Amish continue to

represent their structural and ideological strictness through higher parities than Old Order and New Order Amish, the New Orders now report slightly higher parities than Old Orders. Furthermore, mean parity in the Andy Weaver group, despite earlier being the highest, declined by the greatest margin. We conclude that while the institutional system in which Amish are embedded impacts fertility, these institutions are not static, nor are they fixed in their ordinal relationship. Since 1988, Amish denominations in Holmes County have experienced much social change, in technology, theology (Petrovich 2014), economics (Moledina et al. 2014), household decor, gender roles (Handrick 2019), and dress patterns (Anderson 2019b). The Old Orders have probably experienced the most change, while New Orders are now comparatively stricter on some issues. This shift in the relationship between New Order and Old Order may be explained by historically higher defection rates among New Orders (Friedrich 2001), whereby those most prepared to reproduce the Amish lifestyle remained. Whatever the case, institutional settings help to explain parity variation.

Potentially, structural changes could bring about a more drastic fertility decline, were it not for ideational pronatalism. We sought evidence for a pronatalist ideology by comparing Amish leaders with laymen. In both the 1988 and 2015 data, leaders in all three denominations showed evidence of higher mean parity in their families than laymen, suggesting that those who are closest to Amish theology and exemplify 'our beliefs' (Enninger and Raith 1982) are validating pronatalism. As with farmers, though, fertility in both groups has declined overall.

While our evidence suggests that both structural and ideational factors influence parity, the method used in this restudy did not allow us to explore how both factors interact in a dynamic way to affect fertility change. We need more developed variables and methods. Further, while mean parity is a convenient estimate of fertility, it hides some potentially consequential variations, for example in birth spacing. In future work, we recommend calculation of age-specific and total fertility, decomposition of fertility rates by other measures, analysis of cohort fertility, use of life course analysis, and comparative studies of other Amish groups, as well as related Anabaptists, including the Amish Mennonites, Conservative Mennonites, and Old Order Mennonites, who are all interlinked as 'Plain Anabaptist' co-religionists.

We also recommend using additional structural predictor variables in order to investigate fertility changes more rigorously. It is often assumed that the Amish are heavily or exclusively embedded within their religious group, but their ethno-religious institutions are not the only institutions in which individuals are embedded (Wimmer 2013; Anderson et al. 2019). For example, during the 1950s, the Amish—who were conscientious objectors during the Second World War—experienced a baby boom parallel to that seen in the US, suggesting Amish embeddedness in broader structural and cultural forces (Bailey and Collins 2011). At the micro level the extended family is a critical institution for Amish, directing cooperativeness (Choy 2020), impacting church cohesion (Stein et al. 2020), and likely shaping fertility patterns (Blume 2010).

Looking beyond structural and ideational explanations, we understand little about Amish individuals' ability to control their fertility (Lesthaeghe and Vanderhoeft 2001). While

research has suggested that artificial birth control is used in some but not other churches and cohorts (Dorsten 1999; Miller et al. 2007; Jolly 2014; Anderson and Potts 2020), we know little about its frequency of use, intended use (whether to limit fertility or optimally space births), prevalence, distribution, and where it is obtained from—a critical gap in our understanding of a population that is sometimes labelled a 'natural fertility population' prohibiting all forms of birth control. The contours of natural and artificial means of fertility control merit concerted enquiry alongside structural and ideational analyses, although researchers may find this a challenging subject to investigate (Yost et al. 2005).

Notes and acknowledgements

References

Anderson C 2013. Who are the plain Anabaptists? What are the plain Anabaptists?, Journal of Amish and Plain Anabaptist Studies 1(1):26–71.

—. 2019a. Of process, practice, and belief: What can we learn about old Amish church history and polity from this special issue's source documents? Journal of Amish and Plain Anabaptist Studies 7(2):101–108.

—. 2019b. Plain fashion: The sleek get-ups of Amish go-getters. Conference paper presented at the Society for the Scientific Study of Religion annual conference. St. Louis, MO.

—. 2020. Amish, Pp. 25–27 in The SAGE Encyclopedia of the Sociology of Religion, edited by Possamai A and Blasi A: SAGE.

Anderson C, Donnermeyer J, Longhofer J, and Reschly SD. 2019. A critical appraisal of Amish studies' de facto paradigm, 'negotiating with modernity', Journal for the Scientific Study of Religion 58(3):725–742.

Anderson C and Potts L. 2020. The Amish health culture and culturally sensitive health services: An exhaustive narrative review, Social Science & Medicine 265:113466. [PubMed: 33153874]

Bailey Mand Collins W. 2011. Did improvements in household technology cause the baby boom? Evidence from electrification, appliance diffusion, and the Amish, American Economic Journal: Macroeconomics 3 3(2):189–217.

Blume M 2010. Von hayek and the Amish fertility: How religious communities manage to be fruitful and multiply- a case study, Pp. 159–175 in The nature of god: Evolution and religion, edited by Frey U. Antwerpen, Belgium: Tectum.

Caldwell JC 1976. Toward a restatement of demographic transition theory, Population and Development Review 2:321–366.

Choy JP 2020. Religious rules as a means of strengthening family ties: Theory and evidence from the Amish, Journal of Comparative Economics 48(3):729–748.

Colyer C, Anderson C, Stein R, Donnermeyer J, and Wasao S. 2017. Reviving the demographic study of the Amish, Journal of Amish and Plain Anabaptist Studies 5(1):96–119.

Crenshaw E, Christenson M, and Oakey DR. 2000. Demographic transition in ecological focus, American Sociological Review 65:371–391.

Cross Hand McKusick V. 1970. Amish demography, Social Biology 17(2):83–101. [PubMed: 5538247]

Donnermeyer Jand Anderson C. 2017. The still-changing occupational structure of Amish males: A nationwide profile. Presented at the Amish and Plain Anabaptist Studies Annual Conference. Columbus, OH.

Dorsten L 1999. Fertility decline in a U.S. population favoring large families: A hazard-model analysis of the effect of sib death on Amish fertility, Population Research and Policy Review 18(4):323–338.

Easterlin R 1975. An economic framework for fertility analysis, Studies in Family Planning 6:54–63. [PubMed: 1118873]

Enninger Wand Raith J. 1982. An ethnography-of-communication approach to ceremonial situations. A study on communication in institutionalized social contexts: The Old Order Amish church service. Wiesbaden, Germany: Franz Steiner Verlag.

Ericksen E, Ericksen J, and Hostetler J. 1980. The cultivation of the soil as a moral directive: Population growth, family ties, and the maintenance of community among the Old Order Amish, Rural Sociology 45(1):49–68.

Ericksen J, Ericksen E, Hostetler J, and Huntington GE. 1979. Fertility patterns and trends among the Old Order Amish, Population Studies 33(2):255–276. [PubMed: 11630609]

Friedrich LJ 2001. To be or not to be: An examination of baptism into the Amish church, Dissertation, Rural Sociology, The Ohio State University.

Gingerich Ervin (ed.). 1988. Ohio Amish Directory: Holmes County and Vicinity. Millersburg, OH: Ervin Gingerich.

Greksa L 2002. Population growth and fertility patterns in an Old Order Amish settlement, Annals of Human Biology 29(2):192–201. [PubMed: 11874623]

Handrick FM 2019. Amish women: Work and change- an investigation into the lives of Amish women in Pennsylvania and Ohio, Theology and Religion, University of Birmingham.

Haub C 2003. Fertility measurement, Pp. 420–425 in Encyclopedia of Population, edited by Demeny P and McNicoll G: Thomson Gale.

Heaton TB 1986. How does religion influence fertility?: The case of mormons, Journal for the Scientific Study of Religion 25(2):248–258.

Hewner S 1998. Fertility, migration, and mortality in an Old Order Amish community, American Journal of Human Biology 10(4):619–628. [PubMed: 28561540]

Jolly N 2014. In this world but not of it: Midwives, Amish, and the politics of power, Sociological Research Online 19(2).

—. 2017. Birthing new kinships: The cross-pollinating potential of Amish health research, Journal of Amish and Plain Anabaptist Studies 5(2):147–161.

Lesthaeghe R 1983. A century of demographic and cultural change in Western Europe: An explanation of underlying dimensions, Population and Development Review 9:411–435.

Lesthaeghe Rand Vanderhoeft C. 2001. Ready, willing, and able: A conceptualization of transitions to new behavioral forms, Pp. 240–264 in Diffusion processes and fertility transition: Selected perspectives. Washington, D.C.: National Academy Press.

Lowery Sand Noble A. 2000. The changing occupational structure of the Amish of the Holmes County, Ohio, settlement, The Great Lakes Geographer 7(1):27–36.

Lutz M 2017. Explaining Anabaptist persistence in the market economy: Past paradigms and new institutional economics theory, Journal of Amish and Plain Anabaptist Studies 5(2):239–257.

McKune B (2020, 4 29). Census of the Amish in Holmes County and the Surrounding Areas. https://www.thearda.com/Archive/Files/Descriptions/AMISH.asp

Miller K, Yost B, Flaherty S, Hillemeier M, Chase G, Weisman C, and Dyer A-M. 2007. Health status, health conditions, and health behaviors among Amish women: Results from the Central Pennsylvania women's health study (CEPAWHS), Women's Health Issues 17:162–171. [PubMed: 17459726]

Mitchell B, Hsueh W-C, King T, Pollin T, Sorkin J, Agarwala R, Schäffer A, and Shuldiner A. 2001. Heritability of life span in the Old Order Amish, American Journal of Medical Genetics 102:346–352. [PubMed: 11503162]

Moledina A, McConnell D, Sugars S, and Connor B. 2014. Amish economic transformations: New forms of income and wealth distribution in a traditionally 'flat' community, Journal of Amish and Plain Anabaptist Studies 2(1):1–22.

Nethers J 1983. Occupational changes among the Old Order Amish in the Holmes County vicinity of Ohio, Communal Societies Quarterly(Fall):122–139.

Petrovich C 2014. Technology in the service of community: Identity and change among the andy weaver Amish, Mennonite Quarterly Review 88(1):23–44.

—. 2017. More than forty Amish affiliations? Charting the fault lines, Journal of Amish and Plain Anabaptist Studies 5(1):120–142.

Scott S 1988. The Amish wedding and other special occasions of the Old Order communities. Intercourse, PA: Good Books.

Smith EL 1960. Studies in Amish demography. Harrisonburg, VA: Research Council of Eastern Mennonite College.

Stein RE, Corcoran KE, Kowalski BM, and Colyer CJ. 2020. Congregational cohesion, retention, and the consequences of size reduction: A longitudinal network analysis of an Old Order Amish church, Sociology of Religion.

Vaisey S 2007. Structure, culture, and community: The search for belonging in 50 urban communes, American Sociological Review 72(6):851–873.

Wasao Sand Donnermeyer J. 1996. An analysis of factors related to parity among the Amish in northeast Ohio, Population Studies 50(2):235–246.

Watkins SC 1991. From provinces into nations: The demographic transition in western europe, 1870–1960. Princeton: Princeton University Press.

Wengerd Marvin (ed.) 2014. Ohio Amish Directory: Holmes County and Vicinity, 2015. Walnut Creek, OH: Carlisle Press.

Wimmer A 2013. Ethnic boundary making: Institutions, power, networks. Oxford: Oxford University Press.

Yost B, Abbot C, Harding J, and Knittle A. 2005. Among the Amish: Interviewing unique populations on sensitive topics, Public Opinion Pros 2005(6).

Table 1

Characteristics of Ohio Amish families in 2015 (N=5,598)

	Frequency	Percentage
Occupation of male family head		
Farmer	808	13.91 (15.70)
Non-farmer	4,340	74.74 (84.30)
Missing	659	11.35 (–)
Affiliation		
Andy Weaver (strict)	1,107	19.06
Old Order (moderate)	4,109	70.76
New Order (least strict)	591	10.18
Church leadership status of male family head		
Ordained leader	955	16.45
Layman	4,852	83.55
Mean age of wives at time of first marriage	21.86	
Mean marriage duration (years)	24.94	

Source: Authors' analysis of data from *2015 Ohio Amish Directory.* (Wengerd 2014)

Table 2(a)

Parity distribution of Ohio Amish families, 2015

Parity	Frequency	Percentage
0	436	7.51
1	385	6.63
2	514	8.85
3	621	10.69
4	867	14.93
5	758	13.05
6	648	11.16
7	536	9.23
8	350	6.03
9	249	4.29
10	227	3.91
11	216	3.72
Total	5,807	100.00

Source: As for Table 1.

Table 2(b)

Mean parity of Ohio Amish families by predictor variable, 1988 and 2015

	1988	2015
Overall	5.3	4.85
By occupational status of male family head		
Farmer	6.2	5.95
Non-farmer	4.7	4.45
Missing	n/a	6.21
By affiliation		
Andy Weaver (strict)	6.3	5.43
Old Order (moderate)	5.2	4.66
New Order (less strict)	4.8	5.04
By church leadership status of male family head		
Ordained leader	6.83	6.29
Layman	5.0	4.57

Note: Results for 1988 are only available to one decimal place.

Source: As for Table 1 and *1988 Ohio Amish Directory*.

Table 3

Logistic regression results for parities 0–2, Ohio Amish, 2015

Characteristic	Parities 0–2 (percentage)	Total *N*	Univariate analysis		Multivariate analysis	
			OR	95 per cent CI	aOR	95 per cent CI
Occupation of male family head						
Farmer	92 (11.47)	802	ref		ref	
Non-farmer	1,148 (26.42)	4,346	2.27	(2.21, 3.48)	2.12	(1.65, 2.73)
Affiliation						
Andy Weaver	232 (23.02)	1,008	0.90	(0.76, 1.06)	0.71	(0.59, 0.86)
Old Order	915 (25.01)	3,659	ref		ref	
New Order	93 (19.33)	481	0.72	(0.57, 0.91)	0.89	(0.67, 1.19)
Church leadership status of male family head						
Leader	61 (7.21)	846	ref		ref	
Layman	1,179 (27.41)	4,302	4.86	(3.11, 4.95)	1.90	(1.41, 2.57)

Note: Control variables in multivariate analysis: age of wife at first marriage and marriage duration. OR = unadjusted odds ratio; aOR = adjusted odds ratio; CI = confidence interval; ref is the reference category.

Source: As for Table 1.

Table 4

Logistic regression results for parities 0–5, Ohio Amish, 2015

Characteristic	Parities 0–5 (percentage)	Total *N*	Univariate analysis		Multivariate analysis	
			OR	95 per cent CI	aOR	95 per cent CI
Occupation of male family head						
Farmer	362 (45.14)	802	ref		ref	
Non-farmer	2,917 (67.12)	4,346	2.48	(2.13, 2.89)	2.27	(1.92, 2.69)
Affiliation						
Andy Weaver	531 (52.68)	1,008	0.55	(0.48, 0.63)	0.39	(0.34, 0.46)
Old Order	2,453 (67.04)	3,659	ref		ref	
New Order	295 (61.33)	481	0.78	(0.64, 0.95)	1.00	(0.79, 1.25)
Church leadership status of male family head						
Leader	366 (43.26)	846	ref		ref	
Layman	2,913 (67.12)	4,302	2.75	(2.37, 3.20)	2.33	(1.92, 2.69)

Note: Control variables in multivariate analysis: age of wife at first marriage and marriage duration. OR = unadjusted odds ratio; aOR = adjusted odds ratio; CI = confidence interval; ref is the reference category.

Source: As for Table 1.

Table 5

Logistic regression results for parities ≥ 6, Ohio Amish, 2015

Characteristic	Parities ≥ 6 (percentage)	Total *N*	Univariate analysis		Multivariate analysis	
			OR	95 per cent CI	aOR	95 per cent CI
Occupation of male family head						
Farmer	440 (54.86	802	ref		ref	
Non-farmer	1,429 (32.88)	4,346	0.40	(0.35, 0.47)	0.44	(0.37, 0.52)
Affiliation						
Andy Weaver	477 (47.32)	1,008	1.82	(1.59, 2.11)	2.53	(2.15, 2.98)
Old Order	1,206 (32.96)	3,659	ref		ref	
New Order	186 (38.67)	481	1.28	(1.05, 1.56)	1.00	(0.80, 1.26)
Church leadership status of male family head						
Leader	480 (56.74)	846	ref		ref	
Layman	1,389 (32.29)	4,302	0.36	(0.31, 0.47)	0.62	(0.52, 0.73)

Note: Control variables in multivariate analysis: age of wife at first marriage and marriage duration. OR = unadjusted odds ratio; aOR = adjusted odds ratio; CI = confidence interval; ref is the reference category.

Source: As for Table 1.

Table 6

Logistic regression results for parities>10, Ohio Amish, 2015

Characteristic	Parities >10 (percentage)	Total *N*	Univariate analysis		Multivariate analysis	
			OR	95 per cent CI	aOR	95 per cent CI
Occupation of male family head						
Farmer	51 (6.36)	802	ref		ref	
Non-farmer	100 (2.30)	4,346	0.35	(0.25, 0.49)	0.43	(0.30, 0.62)
Affiliation						
Andy Weaver	62 (6.15)	1,008	2.76	(1.97, 3.85)	3.97	(2.75, 5.73)
Old Order	85 (2.32)	3,659	ref		ref	
New Order	4 (0.83)	481	0.35	(0.13, 0.97)	0.21	(0.08, 0.59)
Church leadership status of male family head						
Leader	49 (5.79)	846	ref		ref	
Layman	102 (2.27)	4,302	0.40	(0.28, 0.56)	0.74	(0.51, 1.07)

Note: Control variables in multivariate analysis: age of wife at first marriage and marriage duration. OR = unadjusted odds ratio; aOR = adjusted odds ratio; CI = confidence interval; ref is the reference category.

Source: As for Table 1.