Journal of Demographic Economics (2020), **86**, 403–434
doi:10.1017/dem.2020.19

CAMBRIDGE UNIVERSITY PRESS

RESEARCH PAPER

Religious prohibition and sacrifice: evidence from the Amish restriction on high school education

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(Received 15 November 2019; revised 6 July 2020; accepted 7 July 2020)

Abstract

The Amish collective objection to high school education and refusal to comply with compulsory schooling laws can be interpreted with a religious-club-good framework. According to the religious-club interpretation, the Amish use the restriction on secular education as a religious prohibition and sacrifice to improve the welfare of sect members. I exploit the 1972 U.S. Supreme Court's decision in *Wisconsin vs. Yoder*, which exempts Amish children from compulsory high school education, as a policy shock to test several key predictions of the religious-club explanations. The evidence suggests that the successful restriction on high school education helped the Amish sect exclude individuals with low religious participation, lower members' shadow cost of time, and grow the sect through higher fertility.

Key words: Amish; compulsory schooling; fertility; prohibition; religious club; sacrifice

JEL classification: J1; J2; I2; D71

1. Introduction

The Amish stirred heated debates in the United States in the mid-twentieth century by stubbornly refusing to comply with compulsory school attendance laws. Their insistence on the eighth grade as the final year of formal schooling, on the basis of their religious belief, frequently led to fines, prosecutions, and even imprisonment by local authorities. After numerous court cases and decades of struggles against the state, the Amish were eventually exempted from compulsory high school education on the grounds of religious liberty by the 1972 U.S. Supreme Court's decision in "State of Wisconsin vs. Jonas Yoder *et al.*" (*Wisconsin vs. Yoder*). Given the positive returns to education widely documented in the economics literature, it appears puzzling why the Amish would collectively enforce a ceiling on years of schooling.

This paper extends Iannaccone's (1992) religious club goods model to offer a rational-choice explanation for why the Amish would collectively restrict high school education. The model posits that religious activities among Amish members generate a positive externality to the Amish sect, which an Amish individual does not take

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https://doi.org/10.1017/dem.2020.19 Published online by Cambridge University Press

into consideration in utility maximization. First, by restricting high school education, the Amish can increase the amount of religious activities chosen within the sect through the price effect of lower wage rates and achieve the socially optimal level. Second, in the presence of unobserved heterogeneity, if the Amish can successfully prohibit high school education, they effectively exclude Amish youths who would lower the positive externality in the sect. The prohibition of high school education serves as a religious sacrifice to help the Amish sect exclude individuals with high shadow cost of time and low religious commitment. According to the religious club goods model, the Amish clashed with the government because compulsory schooling laws imposed a level of schooling exceeding the social optimum for the sect.

The religious club goods model yields a set of testable assumptions and predictions. First, the model predicts that the Supreme Court's ruling would lead to lower educational attainment among the Amish since their restriction on high school education was no longer prevented by the government. Second, the successful prohibition on high school education would reduce the wage rate and increase the fertility of affected Amish individuals. Third, the exemption from compulsory schooling laws permits the Amish to exclude individuals who on average are less likely to attach to the sect and its activities. If the restriction on high school education acts as a religious sacrifice for the Amish to exclude Amish youths who have low religious participation, the Supreme Court's decision should lead to Amish youths with high labor productivity (shadow cost of time) and low fertility leaving the sect. Fourth, exempted Amish individuals with low labor productivity are expected to increase their religious participation due to the price (wage) effect of the exemption. In contrast, exempted Amish individuals with higher labor productivity but chose to remain in the sect might actually decrease religious participation due to the negative income effect of the exemption on their earnings.

Because the Amish speak Pennsylvania Dutch, I can use the U.S. census data to test the model's predictions. The census data reveal that Amish individuals on average have lower educational attainment, lower earnings, lower work hours, and larger family size than former Amish and non-Amish individuals. I estimate that the Supreme Court's decision led to an increase in Amish high school dropout rates by 15 percentage points to 25 percentage points for males and 6 percentage points to 13 percentage points for females. The Supreme Court's exemption decreased average years of completed schooling by 8–10 months for Amish males and 4–12 months for Amish females. The exemption lowered hourly earnings by 23% to 34% and increased births by 0.16–0.34. When I implement a difference-in-difference estimator using non-Amish individuals as a control group to address cohort differences not affected by the exemption, the estimates are similar for earnings, but a little larger for fertility.

If we attribute the fall in log hourly earnings or the increase in fertility to the decrease in educational attainment driven by the exemption, the implied return to education is estimated to be 21–32% in wages and the implied effect of an additional year of schooling on fertility is estimated to be −0.91 births. These estimates are much greater in magnitude than the estimated causal effects of education on earnings and fertility reported by numerous past studies. They are also more than 3–4 times the ordinary least squares (OLS) estimates based on a cross-sectional sample of Amish individuals. The large implied effects of education suggest that the Amish became successful in using the restriction on high school education to induce Amish youths who tend to have low religious participation to leave the sect. Exempted Amish youths who chose to stay in the sect have much lower labor productivity and greater fertility rates than

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older and non-exempted Amish individuals, amplifying the estimated effects of education. When I examine the differential effects of the exemption at various points of the conditional distribution of annual employment hours, which serve as a rough proxy for the lack of religious participation, I find that employment hours decrease at the 0.1 quantile, increase at the 0.9 quantile, and remain unchanged at the mean. The results imply that the restriction on high school education serves as both a religious prohibition that influences the price of religious participation and also a religious sacrifice that induces desirable selection. Given the large implied effects of education and the lack of an employment effect, the findings suggest that the selection effect of religious sacrifice plays a more prominent role than the substitution effect of religious prohibition for the Amish.

The current paper is closely related to Choy's (in press) paper which also offers insights into the effects of secular education restriction on Amish families. Choy (in press) develops an overlapping generation model that explains the roles of religious rules and (shunning) punishment in promoting cooperation and altruism within Amish families. He shows theoretically and empirically that as wealthier Amish parents have better capability than poorer Amish parents to impose strong shunning punishment to prevent their children from leaving the sect, the probability of children leaving the sect is inversely related to parental wealth proxied by land size. One of his model extensions shows that the probability of an Amish individual leaving the sect is increasing in the amount of secular education they receive. We can potentially explain the current findings through the lens of Choy's (in press) model. Accordingly, when Amish parents could not effectively restrict high school education, only the relatively wealthy parents were able to prevent their children from leaving the sect through their stronger punishment power. The Supreme Court's ruling enables poorer parents to keep their children in the sect. The model, however, does not provide further predictions about type selection in the labor productivity dimension like the religious club goods model does. To fully explain the current findings with Choy's (in press) model, we need to assume further that Amish children's labor productivity is increasing in parental wealth, which is a relationship that we do not have the data to substantiate.

The predictions offered by the religious club goods model for the effects of education restriction are identical to the predictions offered by Carvalho *et al.*'s (2017) identity model for the effects of education restriction in the context of the ultra-Orthodox Jews. According to Carvalho *et al.*'s (2017) identity model, when there is a rise in the returns to education, low labor productivity individuals may benefit from restricting education as they *individually* gain more from retaining their religious identity than they do from the returns to additional secular education. Furthermore, by imposing a restriction on education, the religious organization "can improve *individual* welfare further and attract members by (imperfectly) screening out individuals with secular values" [Carvalho *et al.* (2017, p. 128)]. Given that the Amish emphasize community solidarity and suppress individualism [Kraybill (2001)], the focus of the religious club goods model on community gains is perhaps more appropriate in the context of the Amish restriction on high school education.

Iannaccone's (1992) religious club goods model has been applied, extended, and tested in a number of settings, including Israeli ultra-Orthodox Jews [Berman (2000)], radical Muslim groups [Berman and Stepanyan (2004)], Jewish emancipation and schism [Carvalho and Koyama (2016)], low European Catholic fertility [Berman *et al.* (2018)], religious terrorists [Berman and Iannaccone (2006), Berman and Laitin (2008)], and voluntary contribution mechanism [Aimone *et al.*

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(2013)]. In particular, Berman and Laitin's (2008) explanation for the effectiveness of radical religious groups in conducting acts of terrorism lies crucially on their ability to use religious sacrifice to screen committed operatives or exclude uncommitted members. Aimone *et al.* (2013) show that selection effect is more prominent than price effect and that selection enhances the positive relationship between the size of sacrifice and members' contributions to the club in their laboratory experiment where subjects participate in a modified voluntary contribution mechanism game. There is, however, limited field evidence on the relationship between increased sacrifice, type selection, and growth in group size through natural population growth. This paper provides empirical evidence on how religious sacrifice facilitates the effective selection of the desirable type of members and enables population growth through fertility increase, and shows how public policies can influence outcomes of religious sects. The finding that individuals with higher labor productivity are more likely to leave the Amish sect also echoes research by Abramitzky (2008, 2009) that shows productive individuals have a higher tendency to exit Israeli kibbutzim, which practice income sharing. Given the increasing tension between religious groups and states around the globe, understanding how public policies can affect a religious group's capability to increase religious participation and grow its population may shed light on options available to government in influencing the size of religious sect, as well as contributes to the debates pertaining to the freedom to exercise religious beliefs.

2. Background: Amish society and its educational conflicts with the state

Founded by Jacob Ammann in Alsace, France in the 1690s, the Amish are a religious sect that split from the Swiss Anabaptist Mennonites when Ammann advocated the shunning of excommunicated members in daily life.[1] Sociopolitical instability and religious persecution in Europe prompted the Amish to migrate to America and settle in Lancaster, Pennsylvania, in the eighteenth and nineteenth centuries [Hostetler (1993, pp. 31–34)]. In 2000, there were approximately 200,000 Amish residing in the United States, roughly 70% of which are in Pennsylvania, Indiana, and Ohio [Kraybill and Hostetter (2001, pp. 75–77)].[2] Eighty-five percent of Amish are Old Order Amish, who are the most conservative, whereas other Amish groups, such as New Order Amish, Beachy Amish, and Amish Mennonite, are more progressive [Kraybill and Hostetter (2001, pp. 66–67)].

The Amish and other Anabaptists strive to maintain a simple Christian life that discourages material success, seeking to separate themselves from the world and worldly influences. The emphasis on separation from the world governs many of Amish customs, including dress codes, the use of technology, attitudes toward education, and the choice of school. The conduct of an Amish person is regulated by the *Ordnung* of each congregation, which is a set of standards or expectations for behavior [Kraybill (2001, p. 112)]. Unlike other Christian denominations, the Amish and other Anabaptists practice adult baptism. Starting from age 16, unbaptized Amish youths participate in *Rumspringa* and may leave their communities for the outside world. After experiencing secular life for a few years, adolescents who decide

[1]Other Anabaptist groups that are similar to the Amish include conservative Mennonites and the Hutterites.

[2]There are also Amish settlements in the Canadian province of Ontario and Latin America.

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to be baptized into the Church become full-pledged members.[3] Each Amish community is organized around a church district, which typically consists of 30 families with 60 baptized adults and 75 unbaptized youths. The small size of congregations facilitates both mutual aid provision and social insurance; members help each other with barn raisings, harvesting, quilting, births, weddings, and funerals and assistance in the events of drought, disease, death, injury, bankruptcy, and medical emergency [Kraybill and Bowman (2001, p. 113)].

The Amish believe that 8 years of formal schooling is adequate to equip their children with basic skills necessary to be good famers and citizens and to interact with non-Amish people in general. The Amish object to high school education because it exposes their children to worldly influences in conflict with their beliefs. Typical high school curricula and activities not only unnecessary for successful careers in Amish life but also stir aspirations and raise occupational hopes that turn Amish youths away from farm and family [Kraybill (2001, pp. 175–176)].

The Amish preferred one-room schoolhouses, common in rural America throughout the middle of the twentieth century, because the small scale rural allows the community convenient access and control over multiple facets of their children's education. Parents can unexpectedly visit the classroom, the school board can hire Amish teachers (or otherwise sympathetic) teachers and adjust class schedules when special occasions arise [Meyers (1993)]. The small local public schools gave the Amish limited contact with non-Amish people and taught the basic skills needed [Huntington (1994)]. As state authorities consolidated rural public schools and enforced high school attendance, especially during the post-WWII period, the Amish resisted and formed parochial schools to avoid compulsory high school attendance and maintain their traditional education standards.

The first recorded conflict between the Amish and school officials occurred in 1914 in Geauga County, Ohio, when Amish fathers were fined for not sending their children under 16 to public high school [Meyers (1993)]. Over the next 60 years, Amish people continued to face opposition over schooling-related issues from state and local school authorities. Their refusal to comply with compulsory attendance laws frequently led to fines and imprisonments of Amish fathers. Similarly, Amish parochial schools that hired noncertified teachers, who typically had only 8 years of education, also faced repeated shut-down attempts from state agents.

After numerous conflicts between the Amish and school authorities, a compromise was finally reached between the Amish and the state of Pennsylvania in 1956. The concession allowed Amish children who were at least 14 and passed the eighth grade to attend a special vocational school until they were at least 15 years old. Once a week, the children would meet for a minimum of 3 h with an Amish teacher to study English, mathematics, health, and social studies and to report on their week's work at home [Meyers (1993)]. Classroom learning was supplemented by home projects in agriculture and homemaking [Hostetler and Huntington (1971, p. 71)]. Attendance records were kept and forwarded to the state. In 1958, a similar settlement was reached in Ohio.[4] Nevertheless, Ohio state authorities frequently attempted to shut down

[3]The Amish and other Anabaptists practice adult baptism. The typical age of baptism ranges from 16 to the early-20s for the Old Order Amish, and roughly 60% join the church before they reach 21 [Kraybill (2001, p. 117)].

[4]In Ohio, students would continue school until the tenth grade [Hostetler and Huntington (1971, p. 72)].

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"substandard" Amish vocational schools and forced Amish children to attend public high schools throughout the 1960s [Meyers (1993)]. In 1967, a comparable vocational training program was also established in Indiana for Amish children younger than 16 [Hostetler and Huntington (1971, p. 99)].[5] However, conflicts between the Amish and school authorities continued in other states throughout the 1960s.

In 1969, three Amish parents were found guilty of violating Wisconsin's compulsory attendance laws for declining to send their children to public high school after finishing the eighth grade in Green County [Keim (1975, p. 151)].[6] Subsequent appeals to the circuit court failed. In 1971, the Amish brought the case to the Supreme Court of Wisconsin, which reversed the lower courts' decision. Unsatisfied with the result, the State of Wisconsin pressed on to the Supreme Court of the United States. On May 15, 1972, the U.S. Supreme Court ruled that the Amish had the right to refuse their children a high school education [Meyers (1993)]. Since this decision, the Amish have been able to enforce the prohibition of high school education without governmental interference.

3. A religious club goods model

In this section, I extend Iannaccone's (1992) religious club goods model to explain why the Amish would prohibit high school education and refuse to comply with compulsory schooling laws. According to the religious-club interpretation, the restriction on high school education allows the Amish to (1) internalize the positive externality generated from the social interaction among sect members; and (2) ensure that Amish youths who later join the sect are less likely to be those who would "free-ride" in the sect.

3.1 The basic model: homogeneous type of Amish

Consider a simple two-period model. In period 2, the utility of a baptized adult Amish is:

$$u_{2i} = u(S_i, R_i, Q) \quad \text{where } Q = \sum R_{-i}/N,$$

An adult Amish derives utility from time spent in religious activities, R, as well as from the consumption of secular goods, S. Religious activities are more satisfying when members engaging in them are more committed. The average amount of religious time spent by other adult Amish members, Q, is a positive externality and can be thought as the quality of the Amish "club." Mutual aid in the form of community members helping one another with barn raisings, quilt making, harvesting, and weddings are typical examples of Q. For simplicity, assume the current number of other members in the sect, N, is exogenously given.

Adults can participate in the labor force, resulting in a budget constraint of the form:

$$w_i T_2 = pS_i + w_i R_i$$

Total time available in the second period is T_2, which is spent on religious activity R and work hours h (i.e., $T_2 = R_i + h_i$). Income is earned at wage rate w_i per hour worked and spent on consumption of the secular good S, at price p.

[5]The vocational school program was never started in other states [Huntington (1994, endnote 13)].

[6]The Amish parents are Jonas Yoder, Adin Yutzy, and Wallace Miller. Yoder and Yutzy are Old Order Amish, whereas Miller is an Amish Mennonite.

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The wage rate, w_i, is determined by the level of education chosen when the Amish person was young (i.e., period 1):

$$w_i = w(E_i) \quad \text{where } w'(E_i) > 0.$$

The above equation describes labor productivity as a function of education.[7] The assumption that education can only be chosen when young is an obvious simplification, but it is consistent with the observation that education is usually completed before working age. Although it is also common that Amish parents make their children's schooling decisions, Amish youths may pursue higher level of education than the eighth grade during the time of *Rumspringa* and after leaving the sect, or taking a General Educational Development test after dropping out of school.[8]

In the first period, unbaptized individuals derive utility from leisure only:

$$u_{1i} = u(l_i)$$

The young Amish cannot work and must allocate total time T_1 between leisure l and education E:

$$T_1 = l_i + E_i$$

A forward-looking young Amish maximizes life-time utility subject to the time constraint in period 1 and solves the problem by backward induction. Period 2 problem is:

$$\max_{S_i, R_i} u_{2i} = u(S_i, R_i, Q)$$

$$\text{subject to } w(E_i)T_2 = pS_i + w(E_i)R_i.$$

Note that the adult individual takes the wage rate, w and the quality of the club, Q, as given in period 2.

Because the Amish individual does not take into consideration the positive externality generated by his religious activities, the chosen level of R and S will only satisfy the following condition:

$$\frac{w(E_i)}{p} = MRS_{RS}$$

The person ignores the external benefit of his religious participation, MRS_{QS}, that a social planner would consider in the following condition:

$$\frac{w(E_i)}{p} = MRS_{RS} + MRS_{QS}$$

Solving the period 2 problem yields the optimal consumption of the secular good $S_i^*(p, w(E_i); Q)$, the optimal level of religious activities $R_i^*(p, w(E_i); Q)$, and the

[7]Alternatively, we may view education as a signal of (secular) labor productivity in the spirit of Spence (1973). This alternative view may be appropriate if we think that Amish education provides no human capital relevant for the secular labor market, but only serves to signal labor productivity.

[8]See McConnell and Hurst (2006) for a discussion of these cases.

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indirect utility $v_{2i}(p,\ w(E_i);Q)$. Because the marginal external benefit of religious participation MRS_{QS} is not taken into consideration and that MRS_{RS} is decreasing in R, the privately chosen $R_i^*(p, w(E_i); Q)$ and $v_{2i}(p,\ w(E_i);Q)$ will be lower than the socially desired level.

Assuming no discount factor, the individual's problem in period 1 is:

$$\max_{E_i} v_i = u_{1i}(l_i) + v_{2i}(p, w(E_i), Q)$$

$$\text{subject to } T_1 = l_i + E_i$$

The first-order condition yields:

$$\frac{\partial v_{2i}}{\partial w_i}\frac{\partial w_i}{\partial E_i} = -\frac{\partial u_{1i}}{\partial E_i}$$

The left-hand side term is the marginal benefit of education and the right-hand side term is the marginal cost of education.[9] Since the individual will select R and S such that the condition $w(E_i)/p = MRS_{RS}$ holds (ignoring the term MRS_{QS}) in period 2, the utility maximizing E^* will be higher than the socially optimal level.

According to the religious prohibition interpretation, by imposing a level of education lower than the privately chosen level, the Amish sect can make labor market participation relatively less attractive and induce the socially optimal level of religious participation.

3.2 Unobserved heterogeneity and religious sacrifice

When there are unobserved heterogeneous types of Amish persons, the sect can improve social welfare by requesting a "religious sacrifice" from Amish youths in order to discourage free-riders from staying in the club [Iannaccone (1992)]. Following Berman's (2000) exposition, assume two unobserved (labor productivity) types of individuals: high-type (H) Amish and low-type (L) Amish. For each birth cohort, N, the fraction of high-type Amish, θ_H, and the fraction of low-type Amish, $\theta_L = 1 - \theta_H$, are exogenously determined.[10] High-type Amish enjoy higher return to education in the labor market than low-types[11]:

$$w'_H(E) > w'_L(E)$$

Furthermore, assume that $w_H(0) \geq w_L(0)$, so that without education high-type Amish are more productive than low-type Amish in the secular labor market.

[9]The term $\partial v_{2i}/\partial w_i = [\partial v_{2i}/\partial(w_i/p)][\partial(w_i/p)/\partial w_i]$ is non-negative by the property of an indirect utility function, which is non-increasing in (p/w) and (p/w) is decreasing in w. To obtain an interior solution, we need to assume that the Hessian matrix of the objective function is negative semi-definite.

[10]This assumption is restrictive because each generation of N is endogenously affected by Amish fertility (of the older generation) through the level of prohibition and sacrifice set and θ_H may also be affected by assortative mating.

[11]Heterogeneity could alternatively be in preferences for religious activities at the margin. I chose heterogeneity in secular returns to education to simplify the exposition, as well as to focus on variables with data available.

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Given that high-types have a higher marginal benefit of education than low-types and that both types of Amish face the same marginal cost of education, high-type youths will optimally select more education than low-types, i.e., $E_H^* > E_L^*$. This means that a high-type adult will earn higher wages and participate less in religious activities than a low-type Amish would, i.e., $w_H > w_L$ and $R_H^* < R_L^*$.[12]

In the absence of an educational restriction, an Amish sect with predominantly low-type individuals will not gain from having a high-type individual in the sect because that person will lower the average level of religious participation in the sect and decrease the welfare of existing members. That is, because $v_L(p, w; Q_L) > v_L(p, w; Q_{H+L})$, where $Q_L > Q_{H+L}$, $Q_L \equiv \sum R_L^*/N_L$, $Q_{L+H} \equiv \left(\sum R_L^* + \sum R_H^*\right)/N$, and $N_L \equiv \theta_L(N+1) - 1$, low-type individuals enjoy higher Q and utility when high-type individuals are excluded from the sect. If the sect imposes a ceiling on education equivalent to that chosen by low-type individuals and high-type individuals choose to leave, then the sacrifice serves to exclude high-type individuals.

However, if the level of education that low-type individuals would choose optimally is not sufficiently low to deter high-type persons from complying with, then the restriction is not effective in excluding free-riders from the sect. That is, it is possible that high-type individuals enjoy a higher level of utility by complying with the low level of education and joining the low-type Amish sect than by forming their own group:

$$v_H(p, w(E_L^*); Q_{H+L}) > v_H(p, w(E_H^*); Q_H),$$

where $Q_{H+L} \equiv \left(\sum R_H(p, w(E_L^*)) + \sum R_L^*\right)/N$, and $Q_H \equiv \sum R_H^*/N_H$ and $N_H \equiv \theta_H(N+1) - 1$.

If this is the case, then E_L^* is not incentive compatible for high-type individuals.

When E_L^* is not incentive compatible, the sect has to set the ceiling level of education $\bar{E} < E_L^*$ to prevent high-type persons from joining the sect. $\bar{E}$ is incentive compatible, such that:

$$v_H(p, w(\bar{E}); \bar{Q}) > v_H(p, w(E_H^*); Q_H),$$

where $\bar{Q} \equiv \left(\sum \bar{R}_L + \sum \bar{R}_H\right)/N$ and $\bar{R}_i(p, w(\bar{E}))$ for i = H, L. Furthermore, $\bar{E}$ needs to satisfy the participation constraint:

$$v_L(p, w(\bar{E}); \bar{Q}_L) > v_L(p, w(E_L^*); Q_{H+L}),$$

where $\bar{Q}_L \equiv \sum \bar{R}_L/N_L$.

Choosing $\bar{E}$ is costly because if types were fully observable, low-type Amish would have chosen E_L^* and enjoyed a higher level of utility. We may view $\bar{E}$ as grade eight and E_L^* as a high school education. High-type individuals will not comply with the educational restriction $\bar{E}$ and will choose to leave the sect.[13] Since education can only be chosen when young in this simple model, the sacrifice is an "irreversible" act.

[12]As long as the substitution effect of a change in wage is greater than the income effect of a change in wage, the labor supply curve is upward sloping and religious participation is decreasing in wages.

[13]Typically, Amish youths who are not committed will leave the sect during *Rumspringa* and join the secular community and pursue more education.

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3.3 Government enforcement of compulsory schooling laws

When the government enforced compulsory high school attendance, the Amish could not achieve their socially efficient level of education. In the homogeneous case, when the government enforced compulsory high school attendance, non-exempted Amish cohorts attended high school. High school education "causally" increased their labor productivity and shadow cost of time, leading to lower average time high school-educated Amish spent on Amish activities. In the heterogeneous case, when compulsory schooling laws were enforced on the Amish, the Amish sect could not impose the optimal amount of religious sacrifice and admitted members who would lower the average level of Amish activities in the sect. These explain why the Amish would refuse to comply with compulsory schooling laws.

3.4 Testable implications

According to the Amish religious club goods model, the U.S. Supreme Court's ruling permitted the Amish to enforce their socially optimal level of education. The compulsory schooling exemption switched the Amish from an environment in which they were constrained by the government when setting their optimal level of prohibition and sacrifice to one in which they were unconstrained. Thus, the model predicts that the exemption should have an immediate impact on the educational attainment of Amish individuals. With lower educational attainment, we would expect lower labor productivity (wage rates) and higher fertility among exempted Amish.

If the prohibition on high school education solely helps internalizing the positive externality of religious activities, then we would not expect high-type individuals leaving the sect following the exemption. However, if the restriction on high school education also serves as a religious sacrifice to help exclude members who have low religious participation, then the Amish religious club goods model predicts that (1) Amish individuals tend to have lower labor market wage rates than former Amish or non-Amish individuals; (2) the surprising U.S. Supreme Court's ruling would lead individuals with high labor productivity to leave the sect; and (3) the compulsory schooling exemption would encourage women with high shadow cost of child rearing to select out of the sect. The implication is that Amish fertility increases more than the direct effect of education, leading to the growth in Amish population despite an increase in high-type Amish youths leaving the sect. Moreover, the Amish religious club goods model also predicts that the surprising U.S. Supreme Court's ruling would lead (4) Amish individuals with low labor productivity to increase religious participation given the price effect of lower wages, and (5) Amish individuals with higher labor productivity but who chose to stay to potentially decrease religious participation, as the negative income effect from their lower earnings on religious participation may work against the positive price effect from their lower wage rates on religious participation.

4 Data

Data were sourced from the U.S. censuses to test the religious club goods model's predictions. The Census Bureau collected information of the language spoken at home in recent censuses. According to Meyers and Nolt (2005, p. 61), the Amish

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and conservative Mennonites represent almost all of the current speakers of Pennsylvania Dutch, which is a German Dialect.[14] Pollack (1981) reported that as the Amish people shifted to more liberal Mennonite denominations, they ceased to use Pennsylvania Dutch as their primary language, indicating that speaking Pennsylvania Dutch signals attachment to the Amish and conservative Mennonite Church.[15] Since I cannot directly identify the religious denominations of Pennsylvania Dutch speakers in the censuses, the Amish referred to in this paper would include some Conservative Mennonites who speak Pennsylvania Dutch.[16] Specifically, I define a person as an Amish individual when the person resides in a non-single-member household that has at least two Pennsylvania Dutch speakers.[17] For those who report to speak Pennsylvania Dutch, but live in a non-Pennsylvania Dutch household, I define them as former Amish individuals.[18] Since former Amish individuals may no longer report to speak Pennsylvania Dutch at home, this method of defining former Amish individuals is likely to lead to severe undercount.[19] Nevertheless, it provides some crude estimates of the characteristics of former Amish individuals.

Table 1 compares the distributions of Amish population estimates based on different sources of data. The distributions of Amish population estimates across the United States using the decennial censuses are fairly similar to the distributions of Amish population estimated by Kraybill and Hostetter (2001) and Hostetler (1993) using Amish Church membership data, with the decennial censuses tending to undercount the total Amish population.[20] Since 70% of the Amish population resides in Pennsylvania, Ohio, and Indiana, I focus my analysis on individuals living in these three states.

[14]Dutch comes from "Deutsch," meaning German. There are also a number of Amish who speak a Swiss-German dialect [Meyers and Nolt (2005, p. 61)]. Since the 1980 Census, the Census Bureau began collecting information on the language spoken at home for persons above a certain age.

[15]In 1977, 100% of Old Order Amish families living in Plain City, Ohio, used Pennsylvania Dutch as their primary language, but only 11.8% of Mennonite families used it as their primary language.

[16]Conservative Mennonites (Old Order Mennonites) are similar to the Amish in many aspects, such as their plain clothing, horse-and-buggy mode of transportation, preference for one-room parochial schooling, and prohibition of high school education [Kraybill and Bowman (2001)].

[17]In this paper, Pennsylvania Dutch speakers include those who speak Pennsylvania Dutch at home and those with Pennsylvanian German ancestry and speak German at home. I coded a household as a Pennsylvania Dutch household when the household has at least one Pennsylvania Dutch speaker while any other household members speak Pennsylvania Dutch, German, or Dutch. For those who are Dutch or German speaking, they must be native-born to be included. Pennsylvania Dutch speaking people living in single-member households are coded as Amish. If a person is the sole-speaker of Pennsylvania Dutch in a non-single-member household, I code the person as a former Amish person.

[18]A person must communicate with other household members using the same language. Individuals who are the sole-speakers of Pennsylvania Dutch at home are likely to identify Pennsylvania Dutch as their mother tongue, instead of "language spoken at home" per se.

[19]It is also unclear whether persons who are the sole speaker of Pennsylvania Dutch at home constitute a representative sample of all former Amish.

[20]Since both methods provide estimates, it is not clear which one is closer to the truth. It is also not clear whether non-responses will bias the estimates of the characteristics of Amish. The undercount based on censuses may be due to church membership data that include "Swiss Amish" who do not speak Pennsylvania Dutch. Furthermore, the high percentage of children and young adults and the use of non-English language of the Amish are characteristics associated with census undercount. For detailed discussions of census undercount and the extent of undercount, see Edmonston and Schultze (1995) and Edmonston (2002).

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Table 1. Pennsylvania Dutch speakers and Amish population estimates by states

States	(1) All Amish groups 2000	(2) Penn. Dutch speakers 2000	(3) Old Order Amish 1992	(4) Penn. Dutch speakers 1990
Ohio	51,302	22,321	43,200	16,705
Pennsylvania	47,860	47,137	35,200	51,394
Indiana	34,786	11,081	25,200	10,118
Wisconsin	9,561	4,994	7,800	1,583
Michigan	8,591	2,698	6,500	1,595
Missouri	6,701	3,230	5,200	2,474
Kentucky	6,042	2,306	1,500	1,207
Illinois	4,849	1,749	3,200	1,002
Iowa	4,775	1,683	3,700	1,299
New York	4,748	3,694	4,700	2,477
Tennessee	2,248	755	800	882
Kansas	1,599	478	800	848
Minnesota	1,574	490	1,500	691
Virginia	1,390	265	0	675
Maryland	1,127	1,097	1,000	1,740
Other states	5,199	4,590	1,600	3,606
Total	192,352	108,568	141,900	98,296

Note: (1) Kraybill and Hostetter's (2001) estimates of Old Order Amish, New Order Amish, Beachy Amish, and Amish Mennonites; (2) Pennsylvania Dutch speaking households in Census 2000; (3) Hostetler's (1993) estimates of Old Order Amish; (4) Pennsylvania Dutch speaking households in Census 1990.

Tables 2 and 3 compare the characteristics of the Amish, former Amish, and non-Amish adult population aged 18–64 in 1990 and 2000, respectively. Amish are more likely to drop out of school upon finishing grade eight, to be farmers, to have larger families, and to be employed than former Amish and non-Amish individuals. A high fraction of adult Amish males and females have no more than an eighth-grade education. The fraction of eighth-grade dropouts (i.e., individuals dropping out after completing eighth grade) is less than 5% for non-Amish population and around 15% for former Amish persons, but as much as two-thirds for the Amish. Furthermore, the trend in educational attainment is decreasing for the Amish population, but increasing for the non-Amish and former Amish population. The low educational attainment reported here for the Amish is consistent with their objection to high school education. The educational attainment of the Amish is also much lower than members of other religious sects in the United States [Iannaccone (1992)]. Amish individuals tend to have higher employment rates, potentially because they refuse any form of government assistance, including unemployment insurance, and cannot devote as much time to job search when

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Table 2. Descriptive statistics by groups – Census 1990

	(1) Amish		(2) Former Amish		(3) Non-Amish		(1) – (2) Difference
	Obs.	Mean	Obs.	Mean	Obs.	Mean	Mean
Male	34,773	0.48	6,460	0.54	16,726,052	0.49	−0.06
		(0.50)		(0.50)		(0.50)	(0.01)***
Metropolitan	34,773	0.59	6,460	0.72	16,726,052	0.74	−0.13
		(0.49)		(0.45)		(0.44)	(0.01)***
Married	34,773	0.70	6,460	0.81	16,726,052	0.61	−0.11
		(0.46)		(0.40)		(0.49)	(0.01)***
Family size	34,773	5.31	6,460	3.11	16,726,052	2.99	2.20
		(2.97)		(1.34)		(1.50)	(0.02)***
8th grade dropout	34,773	0.62	6,460	0.17	16,726,052	0.04	0.44
		(0.49)		(0.38)		(0.19)	(0.01)***
Years of education	34,773	8.54	6,460	11.40	16,726,052	12.76	−2.86
		(2.62)		(2.76)		(2.38)	(0.04)***
Lab. force participation	34,773	0.68	6,460	0.77	16,726,052	0.76	−0.09
		(0.47)		(0.42)		(0.43)	(0.01)***
Employed	23,732	0.99	4,989	0.98	12,753,372	0.94	0.01
		(0.12)		(0.15)		(0.24)	(0.002)***
Farmer	34,773	0.10	6,460	0.02	16,726,052	0.004	0.08

(*Continued*)

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Table 2. (*Continued.*)

	(1)		(2)		(3)		(1) – (2)
	Amish		Former Amish		Non-Amish		Difference
	Obs.	Mean	Obs.	Mean	Obs.	Mean	Mean
		(0.30)		(0.15)		(0.06)	(0.003)***
Weekly earnings	23,494	435.66	5,241	467.09	13,481,540	470.92	−31.43
		(1,015.43)		(450.15)		(726.13)	(9.09)***
Hourly earnings	23,494	11.30	5,241	11.23	13,481,540	12.27	0.07
		(27.89)		(10.11)		(60.99)	(0.23)
Log hourly earnings	23,494	1.93	5,241	2.22	13,481,540	2.18	−0.29
		(0.95)		(0.61)		(0.75)	(0.01)***
Weeks worked yearly	34,773	32.03	6,460	37.76	16,726,052	35.81	−5.73
		(23.37)		(20.83)		(21.19)	(0.29)***
Hours worked weekly	34,773	30.56	6,460	33.48	16,726,052	31.67	−2.92
		(24.85)		(19.10)		(18.64)	(0.27)***

Note: Native-born adult population aged 18–64 living in Pennsylvania, Indiana, and Ohio. Eighth-grade dropout means having no more than an eighth-grade education. Years of education was coded according to Park's (1994) method. Former Amish are sole speakers of Pennsylvania Dutch in non-single-member households. Non-positive earnings were dropped. Robust standard errors are reported in parentheses. ***Significant 1%, **significant 5%, *significant 10%.

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Table 3. Descriptive statistics by groups – Census 2000

	(1) Amish		(2) Former Amish		(3) Non-Amish		(1) – (2) Difference
	Obs.	Mean	Obs.	Mean	Obs.	Mean	Mean
Male	35,617	0.50	5,587	0.49	17,333,458	0.49	0.01
		(0.50)		(0.50)		(0.50)	(0.01)
Metropolitan	35,617	0.52	5,587	0.70	17,333,458	0.78	−0.17
		(0.50)		(0.46)		(0.41)	(0.01)***
Married	35,617	0.70	5,587	0.81	17,333,458	0.58	−0.11
		(0.46)		(0.39)		(0.49)	(0.01)***
Family size	35,617	5.53	5,587	2.94	17,333,458	2.80	2.59
		(2.90)		(1.43)		(1.49)	(0.02)***
8th grade dropout	35,617	0.65	5,587	0.11	17,333,458	0.02	0.54
		(0.48)		(0.32)		(0.14)	(0.005)***
Years of education	35,617	8.36	5,587	11.98	17,333,458	13.12	−3.63
		(2.42)		(2.54)		(2.30)	(0.04)***
Lab. force participation	35,617	0.66	5,587	0.78	17,333,458	0.77	−0.12
		(0.47)		(0.42)		(0.42)	(0.01)***
Employed	23,459	0.98	4,331	0.99	13,354,908	0.95	−0.02
		(0.15)		(0.08)		(0.22)	(0.002)***
Farmer	35,617	0.09	5,587	0.02	17,333,458	0.003	0.07

(*Continued*)

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Table 3. (*Continued.*)

	(1)		(2)		(3)		(1) – (2)
	Amish		Former Amish		Non-Amish		Difference
	Obs.	Mean	Obs.	Mean	Obs.	Mean	Mean
		(0.28)		(0.13)		(0.05)	(0.002)***
Weekly earnings	23,710	606.33	4,660	727.16	14,358,417	703.73	−120.83
		(951.25)		(1,249.3)		(1,289.24)	(19.31)***
Hourly earnings	23,710	15.98	4,660	16.56	14,358,417	17.61	−0.58
		(41.18)		(28.15)		(79.81)	(0.49)
Log hourly earnings	23,710	2.30	4,660	2.54	14,358,417	2.54	−0.24
		(0.92)		(0.68)		(0.74)	(0.01)***
Weeks worked yearly	35,617	31.19	5,587	39.70	17,333,458	37.76	−8.51
		(23.61)		(19.99)		(20.52)	(0.30)***
Hours worked weekly	35,617	28.46	5,587	35.15	17,333,458	33.10	−6.69
		(24.19)		(19.61)		(18.46)	(0.29)***

Note: Native-born adult population aged 18–64 living in Pennsylvania, Indiana, and Ohio. Eighth-grade dropout means having no more than an eighth-grade education. Years of education was coded according to Park's (1994) method. Former Amish are sole speakers of Pennsylvania Dutch in non-single-member households. Non-positive earnings were dropped. Robust standard errors are reported in parentheses. ***Significant 1%, **significant 5%, *significant 10%.

unemployed. It may also be because the Amish have a stronger social network, which makes finding employment easier than for non-Amish people.[21] The observation that Amish have larger family size is consistent with previous findings regarding the high fertility rates of the Amish.[22]

Tables 2 and 3 also show that the Amish participate less in the labor force, have lower earnings, and work fewer hours on average than former Amish persons and non-Amish persons. These estimates are consistent with the idea that Amish may spend more time on unpaid community activities. The wage gap between the Amish and non-Amish populations is similar to the relative differences in incomes between adherents to most Church-like religious groups and sect members in the United States reported by Iannaccone (1992) and between Israeli ultra-Orthodox Jews and non-ultra-Orthodox Jews reported by Berman (2000).[23] However, the differences documented here do not imply that the Amish are disadvantaged. Indeed, the Amish eschew material wealth and many Amish activities and mutual aids are non-monetary in nature.

The simple comparison between Amish, former Amish, and non-Amish population shows that Amish individuals have fewer years of completed schooling, earn significantly less, and participate less in labor market activities. The differences are consistent with the Amish religious club goods model's predictions. In the next section, I exploit the policy shock induced by the U.S. Supreme Court's decision to test the model's predictions.

5. Empirical evidence

5.1 The impact of exemption on dropout and years of completed schooling

Based on the pooled sample of 1990 and 2000 censuses, Figure 1 shows the fraction of eighth-grade dropouts by Amish and non-Amish birth cohorts living in Pennsylvania, Ohio, and Indiana. The figure clearly reveals that the cohorts born before 1958, who reached age 14 before the Supreme Court's 1972 ruling in *Wisconsin vs. Yoder* and were affected by compulsory high school attendance laws, are considerably more likely to have some high school education. In contrast, there is no discernible difference in the fraction of dropouts for non-Amish cohorts who are never exempted by the U.S. Supreme Court's decision.

I estimate the impact of the exemption on the probability of an Amish person not pursuing a high school education using the following linear probability model:

$$Dropout_i = \alpha_0 + \alpha_1 Post_i + X_i'\alpha + u_i$$

where *Dropout* takes the value 1 if person *i* did not pursue a high school education upon completing grade eight, and 0 otherwise; *Post* indicates if the person was born in 1958 or after (exempted by compulsory high school attendance laws); *X* is a set of control

[21]Amish work for Amish employers, as well as non-Amish employers. For example, Kraybill (2001, p. 247) reports that 11% of Old Order Amish adult men aged 21–30 living in Lancaster work for non-Amish employers.

[22]Amish total fertility rates were estimated to be between 6 and 8 [see Ericksen *et al.* (1979) and Greksa (2002)].

[23]Comparisons based on household incomes reported in Tables 1 and 2 in Iannaccone (1992) and Table 1 in Berman (2000).

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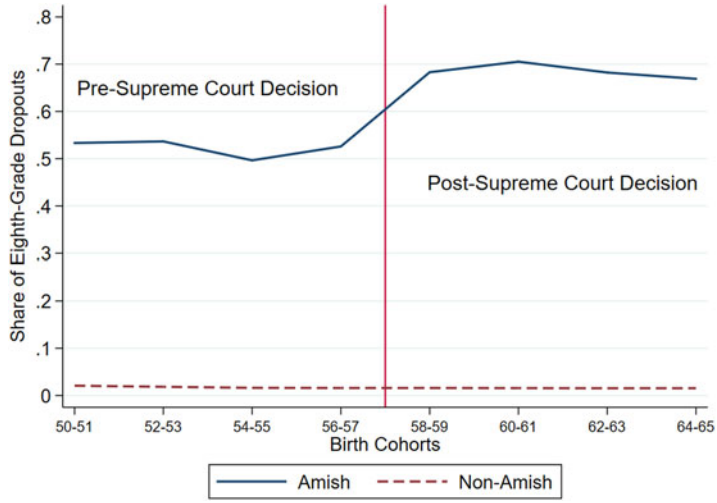

Figure 1. Cohort differences in eighth-grade dropout. *Notes*: Author's own calculation based on pooled Census data sourced from Ruggles *et al*. (2020). Sample includes Amish and non-Amish residing in Pennsylvania, Indiana, and Ohio. Non-Amish are native born white population. Eighth-grade dropout means having no more than an eighth-grade education.

variables, including metropolitan indicator and state dummies; and u is the error term. The coefficient α_1 measures the cohort difference in the likelihood of an Amish dropping out of school upon completing grade eight. Using only individuals born between 1956 and 1959 as the sample, we can avoid confounding cohort effects other than that due to the exemption.

Tables 4 and 5 report the estimated α_1 for males and females, respectively. Columns (1)–(3) report estimates using Census 1990, columns (4)–(6) report estimates using Census 2000. According to the preferred specification (columns 3 and 6) that controls for residential location, the effect of the exemption from compulsory high school education on the probability of an Amish male to drop out of school upon completing grade eight is estimated to be 24 percentage points based on Census 1990 data and 15 percentage points using Census 2000 data. On the other hand, the exemption is estimated to increase the likelihood of an Amish female not pursuing a high school education by 9 percentage points based on Census 1990 data and 13 percentage points based on Census 2000 data.

To examine how the exemption affected Amish completed years of schooling, I estimate the following regression model:

$$Education_i = \alpha_0 + \alpha_1 Post_i + X_i'\alpha + u_i$$

where *Education* is the years of completed schooling; *Post* equals 1 if the person was born in 1958 and after (exempted by compulsory high school attendance laws), and 0 otherwise; X is a set of control variables, including metropolitan indicator and state dummies; and u is the error term. The coefficient α_1 measures the effect of the exemption on Amish completed years of schooling.

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Table 4. Amish male cohort differences in high school dropout likelihood

	(1)	(2)	(3)	(4)	(5)	(6)
	Census 1990			Census 2000		
Post (=1)	0.25	0.25	0.24	0.15	0.15	0.15
	(0.02)***	(0.02)***	(0.02)***	(0.03)***	(0.03)***	(0.03)***
Metropolitan (=1)		−0.04	−0.06		0.01	−0.01
		(0.02)*	(0.02)**		(0.03)	(0.03)
Indiana (=1)			0.12			0.06
			(0.03)***			(0.04)
Ohio (=1)			−0.12			−0.06
			(0.03)***			(0.03)*
Constant	0.50	0.52	0.54	0.49	0.49	0.51
	(0.02)***	(0.02)***	(0.03)***	(0.02)***	(0.02)***	(0.03)***
Observations	1,834	1,834	1,834	1,275	1,275	1,275

Note: Author's estimates using Census data sourced from Ruggles *et al*. (2020). The dependent variable, *Dropout*, means having no more than an eighth-grade education. The omitted state is Pennsylvania. Cohorts born between 1956 and 1959 are included in the sample. Exempted cohorts were born in 1958 and 1959. Robust standard errors reported in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 5. Amish female cohort differences in high school dropout likelihood

	(1)	(2)	(3)	(4)	(5)	(6)
	Census 1990			Census 2000		
Post (=1)	0.08	0.06	0.09	0.14	0.11	0.13
	(0.02)***	(0.02)***	(0.02)***	(0.02)***	(0.02)***	(0.02)***
Metropolitan (=1)		−0.24	−0.20		−0.20	−0.21
		(0.02)***	(0.02)***		(0.02)***	(0.03)***
Indiana (=1)			0.32			0.21
			(0.02)***			(0.04)***
Ohio (=1)			−0.06			−0.05
			(0.03)*			(0.03)*
Constant	0.57	0.73	0.65	0.54	0.65	0.64
	(0.02)***	(0.02)***	(0.03)***	(0.02)***	(0.02)***	(0.02)***
Observations	1,760	1,760	1,760	1,770	1,770	1,770

Note: Author's estimates using Census data sourced from Ruggles *et al*. (2020). The dependent variable, *Dropout*, means having no more than an eighth-grade education. The omitted state is Pennsylvania. Cohorts born between 1956 and 1959 are included in the sample. Exempted cohorts were born in 1958 and 1959. Robust standard errors reported in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

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Table 6. Amish male cohort differences in mean years of completed education

	(1)	(2)	(3)	(4)	(5)	(6)
	Census 1990			Census 2000		
Post (=1)	−0.87	−0.78	−0.70	−0.75	−0.76	−0.76
	(0.14)***	(0.14)***	(0.14)***	(0.14)***	(0.14)***	(0.14)***
Metropolitan (=1)		0.68	0.43		−0.23	−0.08
		(0.14)***	(0.18)**		(0.14)	(0.15)
Indiana (=1)			−0.85			0.28
			(0.14)***			(0.19)
Ohio (=1)			−0.56			0.37
			(0.24)**			(0.17)**
Constant	8.64	8.20	8.58	9.20	9.33	9.08
	(0.10)***	(0.12)***	(0.18)***	(0.10)***	(0.14)***	(0.16)***
Observations	1,834	1,834	1,834	1,275	1,275	1,275

Note: Author's estimates using Census 1990 data sourced from Ruggles *et al*. (2020). The dependent variable, *Educ*, is years of completed education based on Park's (1994) code. The omitted state is Pennsylvania. Cohorts born between 1956 and 1959 are included in the sample. Exempted cohorts were born in 1958 and 1959. Robust standard errors reported in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Tables 6 and 7 report the estimates for males and females, respectively. Columns (1)–(3) show estimates based on Census 1990 data, and columns (4)–(6) are based on Census 2000 data. The preferred specification in columns (3) and (6), the compulsory schooling exemption is estimated to decrease the average years completed schooling for Amish males by 0.7 years based on Census 1990 data and by 0.8 years using Census 2000 data. The estimated effect of the exemption on the average years of completed schooling for Amish females is −0.4 years using Census 1990 data and −1 year using Census 2000 data. The average years of completed schooling fall from roughly 9 years (indicated by the intercept terms) to approximately 8 years (see Figure 2).

The results show that the exemption permits the Amish to impose their restriction on high school education. The restriction raised the probability of not pursuing a high school education and reduced the average years of completed schooling for both Amish males and females.

5.2 Amish cohort differences in log hourly earnings

Since Amish women have low labor force participation rates, the analysis will focus on Amish males only. Table 8 reports the estimated cohort differences in the log hourly earnings of Amish males based on the following regression model:

$$\log(Earnings_i) = \beta_0 + \beta_1 Post_i + X_i'\beta + \epsilon_i$$

where *Log*(*Earnings*) is the log hourly earnings; *Post* equals 1 if the person was born in 1958 and after (exempted by compulsory high school attendance laws), and 0

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Table 7. Amish female cohort differences in mean years of completed education

	(1)	(2)	(3)	(4)	(5)	(6)
	Census 1990			Census 2000		
Post (=1)	−0.45	−0.31	−0.42	−0.96	−0.84	−0.99
	(0.12)***	(0.12)***	(0.11)***	(0.11)***	(0.12)***	(0.13)***
Metropolitan (=1)		1.57	1.35		0.74	0.85
		(0.11)***	(0.14)***		(0.12)***	(0.12)***
Indiana (=1)			−1.39			−1.00
			(0.11)***			(0.12)***
Ohio (=1)			0.07			0.41
			(0.16)			(0.15)***
Constant	8.81	7.75	8.17	9.04	8.62	8.58
	(0.09)***	(0.10)***	(0.15)***	(0.10)***	(0.12)***	(0.12)***
Observations	1,760	1,760	1,760	1,770	1,770	1,770

Note: Author's estimates using Census data sourced from Ruggles *et al*. (2020). The dependent variable, *Educ*, is years of completed education based on Park's (1994) code. The omitted state is Pennsylvania. Cohorts born between 1956 and 1959 are included in the sample. Exempted cohorts were born in 1958 and 1959. Robust standard errors reported in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

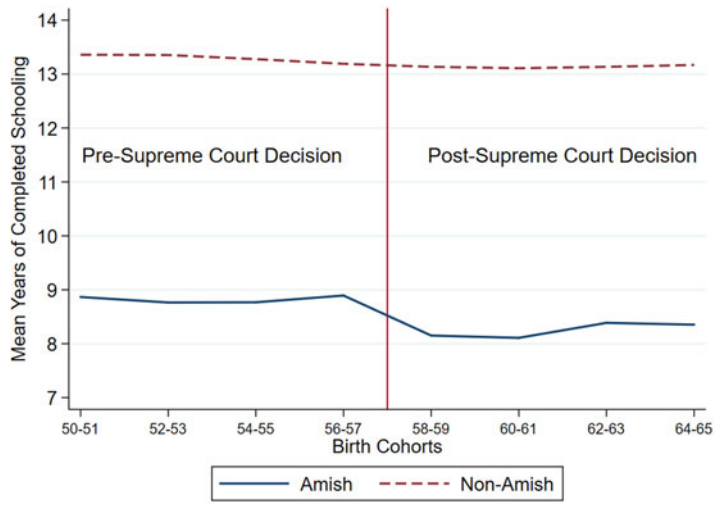

Figure 2. Cohort differences in mean years of completed schooling. *Notes*: Author's own calculation based on pooled Census data sourced from Ruggles *et al*. (2020). Sample includes Amish and non-Amish residing in Pennsylvania, Indiana, and Ohio. Non-Amish are native born white population.

otherwise; X is a set of control variables, including metropolitan indicator, state dummies, marital status, potential experience, and potential experience squared; and ϵ is the error term.

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Table 8. Amish male cohort differences in log hourly earnings

	(1)	(2)	(3)	(4)	(5)	(6)
	Census 1990			Census 2000		
Post (=1)	−0.22	−0.23	−0.30	−0.35	−0.34	−0.34
	(0.05)***	(0.05)***	(0.05)***	(0.04)***	(0.05)***	(0.05)***
Metropolitan (=1)	0.23	0.22	0.21	−0.02	−0.01	−0.02
	(0.05)***	(0.05)***	(0.05)***	(0.04)	(0.04)	(0.04)
Married (=1)		0.21	0.30		0.03	−0.03
		(0.06)***	(0.05)***		(0.05)	(0.05)
Exp.			−0.01			0.19
			(0.07)			(0.12)
Exp. squared			−0.00			−0.00
			(0.00)			(0.00)
Indiana (=1)	0.26	0.24	0.28	0.38	0.38	0.38
	(0.07)***	(0.07)***	(0.07)***	(0.04)***	(0.04)***	(0.04)***
Ohio (=1)	−0.06	−0.08	−0.10	0.44	0.43	0.45
	(0.05)	(0.06)	(0.06)*	(0.05)***	(0.05)***	(0.05)***
Constant	2.20	2.04	2.69	2.57	2.54	−0.14
	(0.05)***	(0.07)***	(0.58)***	(0.04)***	(0.07)***	(1.61)
Observations	1,650	1,650	1,650	1,172	1,172	1,172

Note: Author's estimates using Census data sourced from Ruggles *et al.* (2020). The dependent variable, *Log*(*Earnings*), is the log hourly wage salary and business or farm income. *Experience* = *Age* − *Educ* − 6. The omitted state is Pennsylvania. Cohorts born between 1956 and 1959 are included in the sample. Exempted cohorts were born in 1958 and 1959. Robust standard errors reported in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

The estimates reported in columns (1)–(3) and columns (4)–(6) are based on Census 1990 data and Census 2000 data, respectively. The estimated cohort differences reported in columns (1) and (2) or (4) and (5) are similar whether or not indicators for metropolitan status and marital status are included as regressors. Estimates based on Census 1990 show that the exempted Amish cohorts earned roughly 23% less than non-exempted Amish cohorts. Estimates based on Census 2000 indicate that exempted Amish cohorts earned approximately 34% less than non-exempted Amish cohorts.

Since wage is likely to grow with age and work experience, especially for prime working age males, it is possible that the earnings differences presented in columns (1), (2), (4), and (5) of Table 8 are not totally due to the U.S. Supreme Court's decision. Column (3) shows that the estimated cohort difference becomes greater when potential work experience is controlled for, whereas column (6) shows that the estimated cohort difference is not sensitive to the control variables. However, because exempted Amish cohorts are less educated and they started accumulating work experience at younger ages due to the exemption, potential experience is endogenous. Moreover, as the samples cover only four age cohorts, the variation in potential experience is primarily driven by small differences in ages, which are also correlated

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with the variable *Post*.[24] Hence, including potential work experience as a regressor might actually confound the estimated effect of the exemption on log hourly earnings. Given the problems and the little gain associated with controlling for potential experience, estimates without controlling for potential experience are preferred. I will deal with the problems of age and experience in the next section using a difference-in-difference estimator.

5.3 Amish cohort differences in fertility

Table 9 presents the estimated cohort differences in Amish fertility using the following regression model:

$$Chborn_i = \beta_0 + \beta_1 Post_i + X_i'\beta + \epsilon_i$$

where *Chborn* is the number of children ever born to a woman; *Post* equals 1 if the woman was born in 1958 and after (exempted by compulsory high school attendance laws), and 0 otherwise; X is a set of control variables, including metropolitan indicator, state dummies, and marital status; and ϵ is the error term. Because Census 2000 did not collect fertility information, only estimates based on Census 1990 data are reported.

Columns (1)–(3) present the estimated cohort differences in fertility without controlling for age. Columns (1) and (2) show that exempted Amish women have higher fertility than non-exempted women, who are older. The difference in fertility is roughly 0.35 children. Column (3) shows that controlling for marital status significantly reduces the cohort difference in fertility; exempted Amish women have 0.16 more children than non-exempted women, although the difference is not statistically significant. Given that younger women generally have fewer children than older women, controlling for age may lead to an even greater estimated cohort difference. Column (4) indicates that the estimated cohort difference becomes 0.79 children when age is controlled for. Columns (5) and (6) show that if differential effects of age are allowed for exempted and non-exempted, the cohort difference increases to approximately 0.9 children. However, because the sample covers very few age groups, the estimated cohort differences which have age effects adjusted for are difficult to interpret. Therefore, the estimated cohort difference (without age controls) presented in column (3) is preferred.

5.4 Difference-in-difference estimates

Given the difficulty associated with controlling for age or potential experience in estimating the effects of the exemption on log hourly earnings and fertility, we may use non-Amish individuals as a control group to implement a difference-in-difference estimator to difference out age or work experience specific effect. We can attribute non-Amish cohort differences as differences that are present in the absence of the U.S. Supreme Court's decision.

Table 10 presents the difference-in-difference estimates of the effects of the exemption on log hourly earnings and fertility, respectively. Columns (1) and (2)

[24]We may also widen the age window, but that may introduce model specification bias if the effect of age does not follow the specified functional form.

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Table 9. Amish female cohort differences in fertility – Census 1990

	(1)	(2)	(3)	(4)	(5)	(6)
Post (=1)	0.35	0.34	0.16	0.79	0.90	0.87
	(0.12)***	(0.12)***	(0.10)	(0.20)***	(0.17)***	(0.13)***
Metropolitan (=1)		−0.35	−0.30	−0.35	−0.18	−0.37
		(0.14)**	(0.11)***	(0.11)***	(0.09)*	(0.07)***
Married (=1)			3.45	3.45	3.42	3.80
			(0.09)***	(0.09)***	(0.07)***	(0.05)***
Age (scaled)				0.36	0.45	0.49
				(0.10)***	(0.08)***	(0.04)***
Post × Age					−0.10	−0.30
					(0.10)	(0.04)***
Indiana (=1)	0.71	0.57	0.30	0.33	0.30	0.34
	(0.15)***	(0.16)***	(0.12)**	(0.12)***	(0.10)***	(0.08)***
Ohio (=1)	0.53	0.34	−0.25	−0.28	−0.16	−0.30
	(0.17)***	(0.18)*	(0.16)	(0.16)*	(0.13)	(0.08)***
Constant	2.97	3.26	0.67	0.21	0.01	−0.21
	(0.09)***	(0.14)***	(0.12)***	(0.15)	(0.17)	(0.12)*
Observations	1,760	1,760	1,760	1,760	2,561	4,268

Note: Author's estimates using Census 1990 data sourced from Ruggles *et al*. (2020). The dependent variable, *Chborn*, is the number of children ever born to a woman. The omitted state is Pennsylvania. Columns (1)–(4) use cohorts born between 1956 and 1959 as the sample; column (5) uses cohorts born between 1955 and 1960 as the sample; and column (6) uses cohorts born between 1953 and 1962 as the sample. The variable age is scaled to zero for individuals aged 32 years old (born in 1958). Exempted cohorts were born in 1958 and after. Robust standard errors reported in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

indicate that the U.S. Supreme Court's decision led to a fall in hourly earnings between 15% and 18% based on Census 1990 data. Columns (3) and (4) show that the exemption decreased hourly earnings by 34% based on Census 2000 data. These estimates are smaller than the Amish cohort differences presented in Table 8.

According to columns (5) and (6) of Table 10, the U.S. Supreme Court's decision is estimated to increase fertility by 0.28 to 0.46 births. This estimated effect is much larger than the Amish cohort differences presented in column (3) of Table 9, because exempted Amish would have been expected to have fewer children if the exemption were not in place according to the non-Amish cohort difference.

5.5 Implied effects of education on log hourly earnings and fertility

The estimates presented above show that the compulsory schooling exemption led to lower educational attainment, decreased earnings, and higher fertility. If we attribute the decreased earnings and increased fertility solely to the change in completed years of schooling driven by the U.S. Supreme Court's decision, we could estimate the implied returns to education and the implied effect of education on fertility using an

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Table 10. Difference-in-difference estimates of exemption on earnings and fertility

	(1)	(2)	(3)	(4)	(5)	(6)
	Log hourly earnings				Fertility	
	Census 1990		Census 2000		Census 1990	
Amish × Post (=1)	−0.149	−0.175	−0.338	−0.337	0.464	0.277
	(0.049)***	(0.049)***	(0.044)***	(0.048)***	(0.119)***	(0.104)***
Post-exemption indicator	Yes	Yes	Yes	Yes	Yes	Yes
Amish indicator	Yes	Yes	Yes	Yes	Yes	Yes
Amish × Metro. fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Amish × Married fixed effects	No	Yes	No	Yes	No	Yes
Amish × State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	843,574	843,574	840,329	840,329	952,739	952,739

Note: Author's estimates using Census data sourced from Ruggles *et al.* (2020). The dependent variable is *Log*(*Earnings*) for estimating the returns to education and *Chborn* for estimating the effect of education on fertility, respectively. The omitted state is Pennsylvania. Cohorts born between 1956 and 1959 are included in the sample. The control group is non-Amish white individuals who were native born. Individuals with zero and top coded annual employment hours are excluded from the log hourly earnings sample. Robust standard errors reported in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

instrumental variable estimator. The second-stage instrumental variable regression is:

$$Outcome_i = \pi_0 + \pi_1 Education_i + \pi_2 Post_i + \pi_3 Amish_i + X_i'\pi + \epsilon_i$$

and the first-stage instrumental variable regression is:

$$Education_i = \delta_0 + \delta_1 (Post_i \times Amish_i) + \delta_2 Post_i + \delta_3 Amish_i + X_i'\delta + u_i$$

The dependent variable *Outcome* is *Log*(*Earnings*) or *Chborn*; the variable *Post* × *Amish* serves as the excluded instrument; *Amish* takes the value of 1 for an Amish person, 0 otherwise; and X is a set of control variables. The coefficient of interest is π_1, which measures the return to education when *Outcome* is *Log*(*Earnings*) and the effect of education on fertility when *Outcome* is *Chborn*.

The estimated π_1 does *not* represent the *causal* effect of education, because the instrumental variable does not meet the exogenous condition required for the identification of the causal effect of education. As the Amish religious club goods model predicts that individuals with high labor market productivity selected out of the Amish sect, whereas individuals with low labor market productivity selected into the Amish sect following the U.S. Supreme Court's decision, we expect the excluded instrument to be correlated with the error term in the outcome equation.

Columns (1)–(4) of Table 11 report the estimated implied returns to education; and columns (5) and (6) report the implied effect of education on fertility. The specification that includes a set of controls for metropolitan status, marital status, and state of residence is preferred. The estimated implied return to education is large: 21% using Census 1990 data; 32% using Census 2000 data. Similarly, the implied effect of

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Table 11. The implied returns to education and effect of education on fertility

	(1)	(2)	(3)	(4)	(5)	(6)
	Log hourly earnings				Fertility	
	Census 1990		Census 2000		Census 1990	
Educ (years)	0.162	0.214	0.520	0.317	−1.284	−0.912
	(0.055)***	(0.064)***	(0.154)**	(0.063)***	(0.449)***	(0.432)**
Post-exemption indicator	Yes	Yes	Yes	Yes	Yes	Yes
Amish indicator	Yes	Yes	Yes	Yes	Yes	Yes
Amish × Metro. fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Amish × Married fixed effects	No	Yes	No	Yes	No	Yes
Amish × State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
First-stage *F* stat	66.829	52.530	25.008	63.226	11.984	8.484
Observations	843,574	843,574	840,329	840,329	952,739	952,739

Note: Author's estimates using Census data sourced from Ruggles *et al*. (2020). The dependent variable is *Log*(*Earnings*) for estimating the returns to education and *Chborn* for estimating the effect of education on fertility, respectively. The omitted state is Pennsylvania. Cohorts born between 1956 and 1959 are included in the sample. The control group is non-Amish white individuals who were native born. Individuals with zero and top coded annual employment hours are excluded from the log hourly earnings sample. The instrumental variable for *Educ* is (*Amish* × *Post*), implying that the effect of the exemption on log hourly earnings or fertility is channeled through education. Robust standard errors reported in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

education on fertility is also large: a 1-year decrease in completed years of schooling predicts 0.91 more births.

Past studies estimated that the causal rates of return to an additional year of schooling range between 7% and 20% [Angrist and Krueger (1991), Card (1999), Islam *et al*. (2016)]. The estimated rates of return to education of the Amish presented in Table 11 are greater than most estimates previously reported. It is difficult to conceive that the majority of non-exempted Amish who attended classes once a week for one additional year could possibly get as much as a 21–32% return on education. Indeed, columns (1)–(4) of Table 12 show that when a cross-sectional sample of Amish individuals aged 20–50 is used to estimate the returns to education, every additional year of schooling is predicted to raise hourly earnings by only 2.5–5.4%. The low estimated returns to education for the Amish are remarkably similar to those of other religious sects as shown by Berman and Stepanyan (2004) and Berman (2000).

The estimated effect of education on fertility reported in column (6) of Table 11 is also significantly larger than past estimates. For example, the estimated causal effect of an additional year of education on fertility was between −0.26 and −0.48 births in Nigeria [Osili and Long (2008)] and −0.23 births in Cambodia [Islam *et al*. (2016)].[25] When we use a cross-sectional sample of Amish women aged 20–50 years to estimate the effect of education on children ever born, the (OLS) estimate ranges

[25]The average years of schooling were 5 years [Osili and Long (2008)] and total fertility rate was 6 [National Population Commission (2000)] in 1990 for Nigeria. The figures were 3.1 years and 4.4 births, respectively, for women born between 1950 and 1965 in Cambodia.

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Table 12. OLS returns to education and effect of education on fertility

	(1)	(2)	(3)	(4)	(5)	(6)
	Log hourly earnings				Fertility	
	Census 1990		Census 2000		Census 1990	
Educ (years)	0.025	0.037	0.052	0.054	−0.149	−0.236
	(0.003)***	(0.003)***	(0.005)***	(0.005)***	(0.007)***	(0.008)***
Metro.	−0.002	0.015	0.195	0.195	−0.127	−0.149
	(0.020)	(0.020)	(0.022)***	(0.022)***	(0.052)**	(0.044)***
Married	0.434	0.186	0.216	0.199	3.477	2.414
	(0.017)***	(0.019)***	(0.032)***	(0.032)***	(0.037)***	(0.042)***
Experience	No	Yes	No	Yes	No	No
Experience squared	No	Yes	No	Yes	No	No
Age	No	No	No	No	No	Yes
Age squared	No	No	No	No	No	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,376	11,376	8,046	8,046	12,495	12,495

Note: Author's estimates using Census data sourced from Ruggles *et al*. (2020). The dependent variable is *Log*(*Earnings*) for estimating the returns to education and *Chborn* for estimating the effect of education on fertility, respectively. The omitted state is Pennsylvania. Amish aged 20–50 are included in the sample. Robust standard errors reported in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

between −0.15 and −0.24 depending on the specifications (columns 5 and 6 of Table 12). On the other hand, the implied effect of education on fertility reported in Table 11 is roughly twice the largest estimate produced by Osili and Long (2008) and almost four times the largest OLS estimate reported in Table 12.

For the implied effect of education on log hourly earnings or fertility to be so large, we would need exempted Amish individuals with high labor productivity leaving the sect and lowering the average hourly earnings or raising the average fertility more than the causal effect of education suggests. To illustrate how this selection affects the estimates, decompose the instrumental variable estimator into the true causal effect and bias:

$$\hat{\pi}_1^{IV} \xrightarrow{p} \pi_1 + \frac{cov(z_i, \epsilon_i | X_i)}{cov(z_i, Education_i | X_i)},$$

where z is the excluded instrument, $Amish \times Post$, π_1 is the true causal effect, $cov(z_i, \epsilon_i | X_i)/cov(z_i, Education_i | X_i)$ is the bias, and X represents all other regressors. According to Tables 4 and 5, we know that $cov(z_i, Education_i | X_i) < 0$. For $\hat{\pi}_1^{IV} > \pi_1$, it must be the case that $cov(z_i, \epsilon_i | X_i) < 0$ when estimating the return to education. That is, exempted Amish individuals have unobserved characteristics that are negatively correlated with labor productivity. Similarly, for $\hat{\pi}_1^{IV} < \pi_1$ when estimating the effect of education on

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fertility, we need $cov(z_i, \epsilon_i|X_i) > 0$, which is consistent with exempted Amish females having lower shadow cost of child rearing.

Although there is no other direct evidence that Amish youths with high labor productivity and shadow cost of time left the sect following the U.S. Supreme Court's ruling, qualitative evidence based on the stories told by some former Amish is consistent with this selection effect. In the stories of former Old Order Amish members told to Garrett and Garett (1998), there are examples of Amish individuals leaving the sect in the pursuit of more education and a productive career in the mainstream economy. For instance, in the story of LeRoy, some of the main reasons for him to leave the sect was his dream of finishing high school, his eagerness to read and learn of different people and places, and his desire to live a secular life. In the story of Dan, after leaving the sect, he acquired new skills working in the construction industry and eventually owned a successful remodeling business that employed his own crew. Because once a person has left the sect, the person would be either shunned or excommunicated by their own family members, living a non-Amish life without the help of family can be financially difficult. Individuals choosing to leave the sect need to have relatively high labor productivity in the secular labor market in order not to return to the sect. The statement by a former Amish member, Ed, sums it up: "I have the opportunity to see some actual blood kin that also left to better themselves. I have cousins that are lawyers and nurses… I cannot stress enough the importance of an education. Obviously, the others that left the Amish felt the same way, as the majority found the opportunities to continue their education" [Garrett and Garett (1998, p. 45)].

The large estimated effects of education on log hourly earnings and fertility as implied by the surprising U.S. Supreme Court's decision are consistent with the argument that the Amish collectively use the restriction on high school education as a religious sacrifice to discourage individuals with low religious participation and high labor productivity from staying in the sect.

5.6 The impact of exemption on annual employment hours

With the successful restriction on high school education, the religious club goods model predicts potential differential responses in religious participation among Amish individuals who remain in the sect. Amish individuals who are at the bottom tail of the labor productivity distribution are the type that are more likely to remain in the sect and hence experience a positive price effect of lower wage rates on religious participation. In contrast, Amish individuals who are at the upper tail of the labor productivity distribution are the type that are less likely to remain in the sect. If these high-type Amish choose to remain in the sect, their relatively high earnings mean that the negative income effect of lower wage rates on religious participation may dominate over the positive price effect of lower wage rates on religious participation. Differential responses to the U.S. Supreme Court's ruling at different points of the conditional distribution of religious participation will provide further support for the religious club goods model.

Although data on religious participation are not available, we can use annual employment hours as a rough proxy for the lack of religious participation to test these predictions. Specifically, I use a difference-in-difference specification to estimate the conditional treatment effects of the exemption on annual total employment hours of Amish males at the lower and upper quantiles, following Frölich and Melly

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Table 13. Difference-in-difference estimates of exemption on employment hours

	(1)	(2)	(3)	(4)
	Census 1990		Census 2000	
Quantile: 0.10				
Amish × Post (=1)	−110.00	−116.00	−24.00	−110.00
	(22.25)***	(15.01)***	(10.24)**	(32.70)***
Quantile: 0.90				
Amish × Post (=1)	260.00	260.00	260.00	520.00
	(8.99)***	(15.98)***	(11.59)***	(7.61)***
Mean				
Amish × Post (=1)	−19.93	68.98	−2.78	44.11
	(48.88)	(46.59)	(44.77)	(45.64)
Post-exemption indicator	Yes	Yes	Yes	Yes
Amish indicator	Yes	Yes	Yes	Yes
Amish × Metropolitan fixed effects	Yes	Yes	Yes	Yes
Amish × Married fixed effects	No	Yes	No	Yes
Amish × State fixed effects	Yes	Yes	Yes	Yes
Observations for employment hours sample	847,156	847,156	842,113	842,113

Note: Author's estimates using Census data sourced from Ruggles *et al*. (2020). The dependent variable is *total annual employment hours*. All specifications include a post-exemption cohort indicator, Amish indicator, metropolitan status indicator, marital status indicator, and a set of state dummies. Male cohorts born between 1956 and 1959 are included in the sample. The control group is non-Amish white males who were native born. Individuals with zero and top coded employment hours are excluded from the sample. Robust standard errors reported in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

(2010) and Callaway and Li (2019). Table 13 reports the conditional quantile treatment effects as well as mean effect for comparison. The top panel reports the estimates at the 0.10 quantile. Both Census 1990 and Census 2000 data show that the exemption led to a significant reduction in the labor hours of Amish men at the 0.10 quantile of the conditional distribution. The reduction of 24 to 116 hours is equivalent to between one and four working weeks. The results imply a positive price effect of lower wage rates on the religious participation of Amish men with low labor productivity. The middle panel reports the estimates at the 0.90 quantile. The estimates show that the exemption-induced increase in the labor hours of Amish men at the 0.90 quantile of the conditional distribution is in the range of 9–18 working weeks. The results imply that the negative income effect of lower wage rates on the religious participation more than compensates the positive price effect of lower wage rates on the religious participation for Amish men with higher labor productivity. Finally, the bottom panel reports the estimates at the mean, which indicate that the net effect of the exemption on employment hours is close to zero.

The results are consistent with the religious-club interpretation that the restriction on high school education serves as both a religious prohibition that aims to increase religious participation of Amish individuals and also a religious sacrifice that helps the Amish sect

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exclude Amish youths who tend to have low religious participation from staying in the sect. The zero effect of the exemption on total annual employment hours at the mean together with the large implied effects of education on earnings and fertility suggest that the restriction on education primarily promotes a selection effect. This stronger evidence of selection effect is similar to what Aimone *et al.* (2013) has shown in their laboratory experiment. Since we do not have direct measures of religious participation, the interpretation here must be applied with the data limitation in mind.

6. Conclusion

Given the positive returns to education, Amish prohibition on high school education appears puzzling from a rational choice perspective. This paper uses Iannaccone's (1992) religious-club-good framework to explain why the Amish would collectively restrict education. According to the religious-club interpretation, restricting secular education helps the Amish internalize the positive externality of religious participation and exclude Amish youths who are more likely to free-ride the religious club goods from staying in the sect. Because the enforcement of compulsory high school attendance by the government interfered with Amish community's socially efficient level of education, the Amish collectively refused to comply.

Interpreting the restriction on secular education as a religious prohibition and sacrifice is testable. When the government was enforcing compulsory schooling laws on the Amish, Amish born individuals with high labor productivity and low religious participation (high-type Amish) could legitimately attend high school. These high-type individuals would have been deterred from staying in the sect if the Amish could effectively request them to sacrifice high school education. The surprising U.S. Supreme Court's decision in 1972, which exempts the Amish from compulsory education beyond the eighth grade, permits the Amish to enforce their desired level of religious sacrifice. This increased religious sacrifice predicts that high-type Amish would leave the sect following the exemption. With the successful prohibition on high school education, Amish youths who choose to stay in the sect would face lower wage rates and participate more in religious activities. This price effect of lower wage rates on religious participation is likely to be most pronounced among Amish individuals with relatively low labor productivity.

I use U.S. Census data to test the predictions of the Amish religious club goods model. First, I find that former Amish persons are more educated and enjoy relatively higher earnings than Amish persons on average. Second, exempted Amish cohorts have significantly lower educational attainment than non-exempted Amish cohorts. Third, the exemption led to lower earnings and higher births. The estimated effects of each additional year of Amish education on log hourly earnings (between 0.21% and 0.32%) and fertility (−0.91 births) implied by the exemption are much greater than past causal estimates. The large implied effects of education suggest that individuals with high labor productivity and high shadow cost of child rearing select out of the sect following the U.S. Supreme Court's ruling. As a result of the Supreme Court's ruling, the Amish are able to achieve population growth through increased fertility rates despite increased attrition among individuals with high labor productivity and high shadow cost of child rearing.

I also find a price effect of lower wage rates on annual employment hours, which serve as a rough proxy for the lack of religious participation, for Amish men with low labor productivity. In contrast, the income effect of lower wage rates on annual

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employment hours is particularly strong for Amish men with high labor productivity. Evidence of these differential effects provides further support for the religious-club interpretation. However, the net effect of the exemption on total annual employment hours is zero at the mean. Given the large implied effects of education on earnings and fertility and an overall zero employment effect from the successful restriction on high school education, it appears that the restriction on education primarily facilitates type selection and fertility growth for the Amish.

Acknowledgments. I thank Eli Berman, Julian Betts, Tiffany Chou, John Evans, Nora Gordon, Daniel Hamermesh, Larry Iannaccone, Alex Ivanov, Jacob LaRievere, Rachel McCleary, Craig McIntosh, Birendra Rai, and anonymous reviewers for detailed comments and suggestions. Comments and suggestions by seminar and conference participants at the Meetings of the Association for the Study of Religion, Economics, and Culture (2009), Monash University, UC San Diego, and the Graduate Workshop on Religion, Economics, and Politics (2008) are also acknowledged.

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Cite this article: Wang LC (2020). Religious prohibition and sacrifice: evidence from the Amish restriction on high school education. *Journal of Demographic Economics* **86**, 403–434. https://doi.org/10.1017/dem.2020.19

https://doi.org/10.1017/dem.2020.19 Published online by Cambridge University Press