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Demographic Imperatives and Religious Markets: Considering the Individual and Interactive Roles of Fertility and Switching in Group Growth

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Abstract

Two models seeking to explain the growth and decline of religious groups are prevalent in the literature. The religious market approach emphasizes the role of intergroup competition and in doing so focuses on religious switching. Another perspective emphasizes demographic mechanisms, particularly fertility. Research to date has not considered how switching and fertility interact as mechanisms of growth. Switching and fertility share a significant role in the growth trajectory of a religious group. Early success in gaining members through switching has an important long-term impact which fertility alone cannot produce. The age of those switching into a group can also have significant consequences for the effects of fertility.

Keywords

fertility; switching; growth; market; demography

Introduction

Social scientists have long been interested in the dynamics underlying the growth and decline of religious groups. Many of the classic writers in the field have devoted significant time to theorizing and speculating about factors that influence the size or vitality of religious groups. Most of these writers proposed some version of what has been labeled “secularization theory” (Swatos and Christiano 1999). This perspective, long dominant in the social sciences, argues that all religious groups decline over the long term as modernization leads individuals to become economically secure (Norris and Inglehart 2004), intellectually and scientifically enlightened (Freud 1961), or theologically disillusioned (Berger 1967).¹ However, the secularization paradigm has given way in part to more nuanced perspectives that do not assume a blanket trend and instead attempt to understand why some groups grow while others decline.

Interest in the mechanisms of religious growth and decline has been revitalized in the past twenty years with the rise of the economic or market perspective on religion (Finke and

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Appendix S1. The Simulation Method.

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¹There are also ‘neo-secularization’ arguments that address the decline of “religious authority” more than religious adherence (e.g., Chaves 1994).

Stark 1992; Stark and Finke 2000). Contrary to secularization's assumption of persistent decline, these scholars argue that demand for religion will generally be constant over time. However, religious groups are always competing for individuals, attempting to "win" them over from other groups while also not "losing" any of their current members. Instead of being evidence of wide-spread secularization, the decline of a religious group is said to be due to effectiveness in appealing to adherents. This view of growth and decline has led to an emphasis on measures of intergroup competition, particularly rates of retention and switching, as key drivers of growth or decline.

Another approach to understanding growth and decline has emerged in recent years. This perspective emphasizes demographic mechanisms (Hout, Greeley, and Wilde 2001; Hout 2003; Norris and Inglehart 2004; Kaufmann 2008, 2009; Skirbekk, Kaufmann, and Goujon 2010). In particular, differences in fertility are said to play a significant role a group's growth trajectory.

There have been relatively few direct comparisons of these growth models. Most assessments have concluded that fertility is far more significant than switching (e.g., Hout, Greeley, and Wilde 2001). These assessments are limited in three primary respects. First, they often do not shed light on the processes underlying each mechanism so even if one is found to be more powerful than the other, the reason is not entirely clear. Second, it is difficult to fully interpret or appreciate the empirical aspects of either fertility or switching because other factors, such as immigration, may also play a role. Finally, because most research has focused on larger established groups or on meta-groups (e.g., Conservative Protestants), little is known about how fertility and switching interact across the entire development of a single religious group. Using growth models, we present several different simulations of group growth assessing the impact of switching and fertility over periods of religious group development. The specific methods used is fully described in an appendix available online at wileyonlinelibrary.com

Switching and the Religious Market

The combined effects of retaining current members and gaining new members might at first seem to be the most obvious mechanism of growth or decline for religious groups.² Among religion scholars, thinking about religious retention and switching as a key growth factor has a certain appeal because it seems to emphasize the religious element of a group. That is, if a group is growing because large numbers of individuals are choosing to join, then this is somehow more reflective of the group's particular religious offering.

Groups' net switching rates are usually measured by assessing what proportion of those raised in a particular group or denomination remain in that group as adults and, if they do not remain in their origin group, what group they joined. Research on religious switching has shown that it typically occurs during periods of significant change in individual's social capital, such as when moving away from home or getting married (Sandomirsky and Wilson 1990; Musick and Wilson 1995; Bibby 1997; Loveland 2003). As a result, it tends to be concentrated during the age period when such events occur, say roughly 16 to 45. One study found that the mean age for a first switch varied between 22 and 25 depending on the group of origin and between 31 and 32 for second switches (Roof 1989:534).

²Technically, "conversion" is used to refer to a broad religious change, such as from Christian to Hindu. "Reaffiliation" is used to refer to denominational switching (e.g., Lutheran to Methodist). See Stark and Finke 2000.

Fertility and the Demographic Imperative

Although most religion scholars have tended to emphasize processes like retention and switching, demographers have long focused on the central role of fertility in the growth of any population. There has been some consideration of religious fertility differentials within this literature, often focusing on the Protestant-Catholic gap (Westoff and Jones 1979; Mosher and Hendershot 1984a, 1984b; Mosher, Williams, and Johnson 1992). However, many of these studies were interested in the fertility numbers themselves and not necessarily in their explicit implications for growth or decline; although clearly there was some awareness of these implications.

The connection between fertility and growth patterns became more explicit in Hout, Greeley and Wilde's (2001) analysis of Protestant denominations over the past several decades. They concluded much of the growth or decline of these denominations could be explained by fertility differentials and implied that the 'religious' component of religious growth was thereby eliminated:

The mainline clergy need not feel responsible for their denominations' slippage so long as the main source of change is the fertility decisions of Protestant families. Meanwhile, conservative clergy and laity can feel gratified that their most recent growth has little or no ideological content; its source is the greater number of young people raised in their tradition (Hout, Greeley, and Wilde 2001: 498).

But fertility clearly has its own ideological component that is influenced by attitudes towards marriage, gender roles, and other factors that can themselves be influenced by an individual's religious group.³

Still, the study did highlight the power of fertility in determining the trajectory of a religious group's size, a point that has not escaped some groups. As an extreme example, a small but growing group of conservative Protestants in the "Quiverfull" movement have been advocating that members disavow all forms of birth control and have as many children as possible (Finan 2006; Joyce 2009). This movement has theological underpinnings of course, but there is a clear awareness among its leaders that growth is an obvious outcome, often with the intent of countering other groups' fertility-driven growth. As one writer in this movement put it (Hagerty 2009):

We look across the Islamic world and we see that they are outnumbering us in their family size, and they are in many places and many countries taking over those nations... just by multiplication (Hagerty 2009, under "Womb is a powerful weapon").

Normally Observed Ranges

Although not always explicitly recognized, both switching and fertility tend to have upper and lower bounds when observing typical groups. That is, both mechanisms have ranges of how large or small they get, whether these ranges are produced by biological, social, or organizational forces.

Research on switching has shown that it typically occurs through social ties (Snow, Zurcher, and Eklund-Olson 1980; Stark and Bainbridge 1980; Stark and Finke 2000: 117-118). A close friend or family member is much more likely to motivate a person to join a group than an unconnected individual (e.g., a missionary). This means that each adherent of a religious

³As Blalock, Jr. (1961) pointed out, indirect effects are still real and important if they can be causally connected with mediators and an outcome.

group has a very limited pool of strong ties that they have a decent chance at recruiting and beyond that pool recruits will be difficult to acquire.

One might assume that those groups that are particularly adept at gaining members would also succeed at keeping their members. Interestingly, this is not necessarily the case as there seems to be a general volatility factor that can shape both retention and conversion. The recent U.S. Religious Landscape Survey (Pew Forum on Religion and Public Life 2008), for instance, found that Jehovah's Witnesses would almost double their size from individuals switching into the group if it were not for the losses of many individuals raised as a Jehovah's Witness to other groups. The same could be said for some other groups that gain large numbers through switching, such as Pentecostals. In the end, most large groups end up having a net switching effect of plus or minus 10 to 20 percent from one generation to the next.

While growth through switching appears to have social and organizational forces creating lower and upper bounds, fertility has its own biological and social limits. The biological upper bound of fertility has been estimated at 15.3 births per woman (Davis and Blake 1956), although it is rarely achieved due to various social and biological constraints (or, "proximate determinants") on fertility including the proportion of women married in a population, average age at marriage, duration of postpartum (lactational) infecundability, natural fecundability (or, waiting time to conception), frequency of intercourse, onset of permanent sterility, spontaneous intrauterine mortality, and duration of the fertile period (Bongaarts 1978, 2003; Bongaarts and Potter 1983). Most historic populations practicing "natural fertility" (or, fertility in the absence of deliberate birth control) exhibit a maximum parity of around 8 children per woman (Henry 1961). A classic example of this upper bound of fertility is the Hutterites whose rates were estimated around 8 to 9 children per woman in 1950 (Bongaarts 1975; Coale and Tye 1961). The Old Order Amish community is another example of a group which has retained consistently high fertility levels with total fertility rates (TFR's) over 6.0 (Grekso 2002; Rowthorn 2011). On the less extreme side of the range, the Latter-day Saints, commonly known as Mormons, are also known for having relatively high TFRs of about 3.0 (Mosher, Williams, and Johnson 1992; Kaufmann 2007).

Comparing Effects

When comparing switching and fertility, the primary question is whether the normally observed upper bound of fertility is more or less powerful in generating growth than the normally observed upper bound of switching. Similarly, is the lower bound of switching more or less detrimental to growth compared to the lower bound of fertility?

To answer this question, we simulated the growth of a hypothetical religious group that comprises 1 percent of the US population in 2000 (2,814,219). In each simulation, mortality is held constant; group members die at the same rate as those of the same sex and age in the U.S. population in 2010. To assess the impact of fertility, net switching rate is held constant and "high" and "low" fertility rates are modeled (corresponding with the high and low in the normal occurring range). To assess the impact of switching, net fertility is held constant and "high" and "low" net switching rates are modeled (corresponding to the high and low in the normal occurring range). The methodology is described in greater detail in the Appendix posted online at wileyonlinelibrary.com.

The answer, simply put, is that the normally observed upper and lower bounds of fertility have a more powerful effect, whether positive or negative, on the growth trajectories of religious groups. As Figure 1 shows, variation in net switching rates across the normally observed range of values produces relatively modest differences as a group moves through time. The scenario that has the upper-bound net switching rate of +20 percent ends the

projection with 1,312,456 more adherents (47 percent) than the scenario with the lower-bound net switching rate of -20 percent. While the differences between these scenarios are not trivial, all of the groups' trajectories were relatively similar in that they saw significant growth. Indeed, it appears in these scenarios that the high fertility rate of 3.0 utilized in the simulations was able to overcome much of the difference in switching.

In Figure 2 we see the projections where the switching rate is set at the level of +10 percent but the fertility rate varies from 1.5 to 6.0. The gap between the groups with the upper bound and lower bound fertility rate is 18,292,425 (650 percent). Even if we discard the 6.0 upper bound as unlikely to occur frequently in contemporary society, the 3.0 TFR scenario still produces over 110 percent more growth than the lower bound 1.5 scenario.

Fertility can be a powerful mechanism of growth because the growth it produces compounds on itself. Put simply, a couple that has three children who each go on to have three children and so on will start to produce large numbers of people in a relatively short period of time. Furthermore, if life expectancy is long enough, these increasingly larger generations will combine to increase the total group size even more. That is, the original parents will still be alive at the same time as their children, grandchildren and even possibly great-grandchildren.

If we were to think of a religious group as consisting of pairs of individuals needing to *at least* replace themselves to maintain the group's size, then each of these 'couples' need to recruit individuals into the group, produce children, or apply a combination of both strategies. In other words, each couple would have to recruit two people to join if they remain childless, have two children with perfect retention rates, or have one child and recruit one person.⁴ If we plotted these options it would look like Figure 3.

We see that for groups with low fertility, say one child per couple on average, the group would need to have a recruitment rate of about 50 percent. In other words, in addition to having their one child each couple would need to convince another person to join the group, while at the same time making sure that their child does not leave the group. Clearly starting at such a deficit puts a group's growth in a difficult position. As fertility goes above replacement level (or about 2.1 births per woman), then a group is given some room for losses while also being freed from any need to recruit from the outside. For example, a group that averages four children per couple could lose almost half of them, recruit no one into the group, and still maintain their size.

Breaking the Bounds?

Although we have been considering the *normally observed ranges* of switching and fertility rates, it is worth asking whether these typical ranges can be exceeded and what the effects of doing so would be. Fertility is much more limited in this regard. The simple fact is that the biological limit on the number of children each woman could possibly have is firm. On the other hand, switching rates *could* provide much more potential for exceeding the typical ranges examined above.

Indeed, research on the early years of some successful religious groups have found them far exceeding the typical ranges of switching rates seen in older, established groups. For example, Skolnick et al. (1978) argue that, although Mormon fertility was quite high, conversions were critical to group growth in the early stages of establishing Mormonism.

⁴Although we default to using the simple example of two children, it would be more accurate to apply a fertility rate of 2.1 children (or, "replacement-level fertility"). Because this takes into account the risk of infant mortality, the "replacement-level" fertility rate is slightly larger than 2.0. Also, we are assuming that recruitments would be for people who are younger than childbearing age.

Proselytizing efforts were targeted in the Midwestern U.S. and in Europe, eventually spreading to other areas of the U.S. Different estimates have been put forth detailing the growth of Mormons over time. These efforts led to rapid growth. Stark and Finke (2000) outline Mormonism's growth from the original 23 members in 1830 to 17,000 in 1840. A group of demographers found slightly different growth rates, but replicate the overall trend. Skolnick et al. (1978) estimate the group contained 15,000 members in 1846 and 30,000 members in 1856. Either of these estimates document incredible growth in a short period of time, largely due to the work of net switching. To produce this same growth through fertility alone, the fertility rate would have to be many, many times greater than the biological upper-limit would allow.⁵

Interactive Effects

While much of the research has focused on parsing out the relative effects of switching and fertility on religious groups' growth, the early Mormon growth raises the question of how the two mechanisms might interact with each other.

Switching Early, Fertility Later—All groups, no matter how large they are now, begin with only a handful of members. The power of fertility is extremely limited under such conditions. Even with a very high fertility rate groups do not have the membership base to make growth sizable; at least not for a very long time. Indeed, groups like the Old Order Amish have had a very high fertility rate both historically and today (Hewner 1998), but they have not grown nearly as large as they might have grown had they had a high fertility rate and a large membership base early on.

The Mormons built a large membership base very quickly in their early years, by far exceeding the typical upper bound of growth through switching. But what if they had not been able to build this base in their early years? Most religious groups are short-lived and are never heard from again because they do not build a large membership base. Even if extremely high fertility rates are maintained, how long would it have taken the Mormons to reach the size they did in the span of twenty years without any recruiting success? What would have been the long-term growth consequence of not rapidly building a base on which the effects of fertility could have an effect?

We can consider these questions and demonstrate the importance of early conversions to long-term growth through another simulation. Consider a new religious group that begins with 200 members—100 women and 100 men—and they experience 2010 U.S. age-specific mortality rates. In one scenario, the group does not successfully bring in new members, but they do have a high fertility rate. In a second scenario, the group has a high fertility rate, but they also successfully recruit new members during the first decade of existence, although recruitment success that tapers off over time.

Borrowing from mathematical models recently developed in the migration literature (Alho 2008), we can model growth of a stable population through fertility, mortality, and switching.⁶ This approach situates conversions not as a specific value or percent change (as we have done in the previous simulations) but rather as a proportion of the number of births in a given population. For instance, a value of 2 for this parameter would indicate two

⁵Some Mormons were practicing polygamy in the nineteenth century. However, Bean, Mineau and Anderton (1990) found that polygamy often reduced women's fertility, particularly for higher order wives.

⁶This approach represents a significant step forward in the demographic literature since previous approaches were limited to modeling fertility and mortality alone, and is grounded in prior literature on replacement migration (e.g., Bermingham 2001, Coleman 2002, Espenshade 2001, Bouvier 2001, Meyerson 2001, Schmertmann 1992.)

conversions into a given religious group for every one birth to the members of the existing group's population.

Figure 4 shows the growth of a group under the first scenario—a relatively low (compared to the next scenario) conversion-to-birth ratio of 1 conversion for every 4 births which is constant throughout the group's history. The group maintains a consistently high fertility rate over time comparable to a total fertility rate of 4.⁷ Growth over the course of 200 years is exponential, ending with around 80,000 members.

Figure 5 shows the growth of a group under the second scenario—a high conversion-to-birth ratio in the first decade, and then a low ratio thereafter. This group has 10 conversions to every birth in the first decade, then 1 conversion to every 4 births after the first decade. Is a 10 to 1 conversion to birth ratio in the early years of a group reasonable in the real world? The Mormons went from a couple dozen members to 17,000 in 10 years, which is an annual rate of growth of about 66 percent. Even they had a very high fertility rate during this time, to produce such growth the conversion to birth ratio would have had to been much higher than 10 to 1. In fact, in order to produce an annual 66 percent growth rate, they would need 60 conversions per birth, assuming each woman had 8 surviving children on average.⁸ So, a 10 to 1 ratio does seem quite reasonable (even modest) for a young and successful group in its early years.

Again, fertility is the same in this scenario as in the previous (comparable to a TFR of 4). Here we see the same type of exponential growth over time, but the early success in conversions yields a remarkably larger population over time. The final population in this scenario is close to 1,000,000. Comparing these figures supports what we have thus far argued theoretically: conversions in the early years of a religion's history can be a powerful mechanism for subsequent long-term growth through fertility.

Our simulation suggests that without large numbers of converts in the early years, each couple in our hypothetical new religious group would have to contribute to the group throughout their lifetime over 12,000 surviving children in order produce the same population growth as experienced by the Mormons in their first decade of existence—clearly an impossible feat. The key reason is that growth due to conversions can (and *did* in the early history of the Mormons) exceed the biological limits of growth due to fertility.

Switching but No Fertility—Of course, while the long-term power of fertility in part depends on the group's success at bringing in new members, particularly in its early development, the power of switching is also dependent on the fertility of those new members (Arthur and Espenshade 1988). Getting someone to join a group would seem at first to be the most natural and effective manner of growing a religious group. Converts are an addition that does not need more long term processes, such as family formation and childbearing. However, a person joining a group may be partially or completely finished raising children. In this case the new member will only count towards growth for a few decades until they are deceased. In short, there are no long term dividends resulting from people switching into the group if they don't reproduce after switching.

To put this concretely, imagine if a group was moderately successful at recruiting people between the ages of 50 and 55, but had no success with younger people. If this group

⁷Because we are modeling the growth of women only (for the sake of mathematical simplicity), we use a "net reproduction rate" of 2 which indicates that every woman would produce two daughters in her lifetime, given a set of age-specific fertility and mortality rates. This is only somewhat similar to a total fertility rate, because it also encompasses mortality while TFR does not.

⁸If fertility were as at its biological maximum (around 15.3 births per woman), the ratio of conversions to births would still be as high as 32 to 1.

experienced 2010 mortality conditions, replacement-level fertility (meaning that fertility does not contribute to their growth) and 1 net conversion per birth, then an initial group of 100 would reach 141 after 50 years, or an annual growth rate of 0.7 percent. Since most of the converts are too old to have children, virtually all of the growth occurs among those 50 years of age and older. However, if the converts were younger, say between the ages of 30 and 34, the group would reach 222 in fifty years, nearly 60 percent larger than when converts are older. Younger converts add to the population by joining the group themselves as well as by adding children to the group.

To show the general association between age at switching and group growth, we repeated this simulation for each age group, each time assuming net switching is concentrated entirely in that age group. As shown in Figure 6, switching is most effective at increasing the size of a group when it occurs at the beginning of women's reproductive years (20-24). Conversions at these ages add to the group both the converts and their soon-to-be-born children. Conversions are moderately effective at younger ages. Child converts increase the size of the group, but it takes longer for them to have children of their own. Finally, conversions are least effective when it occurs in the post-reproductive years (40 and older); these people add themselves to the group but die sooner than younger converts.⁹

Conclusion

Our goal here was to explore how switching and fertility influence the growth and decline of religious groups. A more nuanced understanding of each mechanism is offered by isolating and then manipulating each mechanism. Instead of trying to identify one mechanism as the only important factor, we have tried to understand how both can play an important part in a group's history. While fertility is clearly a powerful source of growth in the long-run, if a group does not succeed at gaining members through switching, particularly in its formative years, it is likely doomed to a short and/or marginal existence. Both switching and fertility are crucial to the growth or lack of growth of a new religious group.

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⁹The age pattern may look a little different for men because they have children at older ages than women. Also, if a person with young children joins a religious group, he or she may join along with children, so, for example, if a 35-39 year old woman with children joins, the number of people added to a group is higher estimated in Figure 6.

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Figure 1.
Simulated effects of switching on group growth.

Figure 2.
Simulated effects of fertility on group growth.

Figure 3.
Required Net Switching by Fertility Rate

Figure 4.
Simulated growth with low levels of conversion and high fertility throughout a group's history (starting group size=200)

Figure 5.
Simulated growth with high levels of conversion in the first 10 years and low levels of conversion thereafter and high fertility throughout (starting group size=200)

Figure 6.
Simulated Population after 50 years Assuming Initial Population of 100, Replacement Fertility and One Net Conversion per Birth

Table 1

Examples of the range of groups' switching rates

Group	Percentage Gain Through In-Switching	Percentage Loss Through Out-Switching	Net Change Through Switching
Jehovah's Witnesses	83%	67%	17%
Pentecostals	67%	51%	15%
Lutherans	25%	42%	-16%
Baptists	22%	40%	-18%
Catholics	8%	32%	-24%

Source: 2001 U.S. Religious Landscape Survey

Table 2

The range of religious groups' total fertility rates

Group	Total Fertility Rate
Old Order Amish	6.2 - 6.96
Mormons	3.06
Hispanic Catholics	2.75
Conservative White Protestants	2.13
Non-Hispanic Catholics	1.70 - 2.11
Liberal White Protestants	1.40-1.84

Sources: Skirbekk, Kaufmann and Goujon 2010; Greska 2002; Rowthorn 2011; Kaufmann 2007; Mosher et al. 1992.