

Chapter 8

The Reproductive Benefits of Religious Affiliation

Michael Blume

Abstract As the brain of early humans expanded, they gained increasing abilities of considering cooperative tasks – finally including reproduction. The subsequent, probably convergent evolution of religious beliefs and related behaviors such as burials and offerings among *Homo sapiens* and among *Homo neanderthalensis* illustrates that religious abilities evolved as a logical consequence: perceived supernatural agents like ancestors or Gods are experienced as observing streams of tradition conferring values and communal trust, rewarding cooperative adherents and punishing transgressors. They advocate reproductive motivation as well as marriage. Believers may signal their trustworthiness to each other by costly obligations and rituals dedicated to the supernatural agents. Religion-related genetic dispositions as well as demographically successful traditions are thus favoured by direct and kin selection and by sexual selection, as shown by the Swiss Census 2000 and international demographic data.

8.1 Old Game with New Rules: Pondering Reproduction

In 1838, a young man took a paper, titled it with “That’s the question” and drew a line on it. Then he assembled arguments regarding marriage. In doing so, he noted, he would lose liberties to choose his whereabouts and friends. He would probably never be able to visit America and learn French and he would have to carry the financial costs of children. The list of arguments favouring marriage was started with “Children (if it’s God’s will)”, having a “nice woman” around when enjoying books and music and not being alone when old. His decisive thoughts initiated by a written “My god” he finally concluded, “Marry, Marry, Marry”.

But of course, the young man needed a cooperative partner to fulfil his plans. So he visited his cousin, Emma Wedgwood. They talked, but although the young man

M. Blume (✉)
University of Heidelberg, Institut für Religionswissenschaft, Akademiestraße 4-8,
69117 Heidelberg, Germany
e-mail: mi.blume@t-online.de

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was known to have inherited a fortune, Ms. Wedgwood took special interest in his religiosity. Only after being convinced that her suitor was a faithful Christian, she agreed to become his wife and to have children with him.

This young man weighing up biographic, economic and reproductive arguments was named Charles Darwin. Randal Keynes republished these and other details recently – one of the great-great-grandsons of Darwin who would not have been around if his ancestor had decided otherwise (Keynes 2001).

The exciting fact about this biographical record is that we are confronted with a contradiction. On the one hand, we know about Darwin's tentative assumption that mankind may be driven by a Malthusian, reproductive imperative like all other animals (Darwin 1871). And on the other hand, we read about a biographical Darwin who went through rational decision making, calculating benefits and costs of marriage and children – citing religious terms in the process. Many theorists of human evolution still tend to ignore or downplay the difference between genetically fixed and human reproduction strategies, assuming that the results must somehow be the same. But are they?

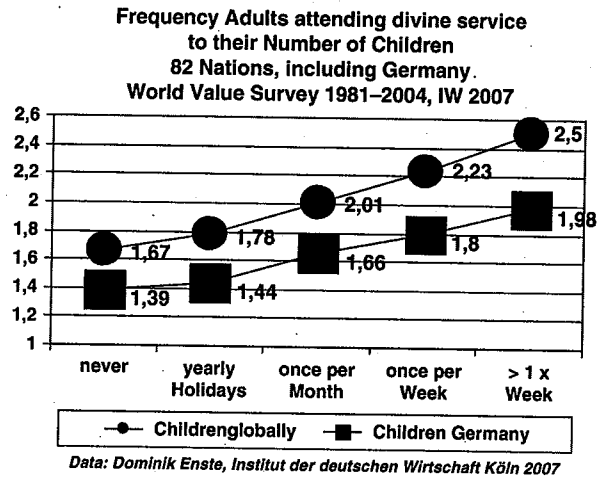
Darwin has not been alone in deciding reproductive matters. Ethnologists have found plenty of evidence among recent hunters and gatherers regarding cultural marital constraints to sexuality, the use of contraception and even infanticide (e.g. Lee and Devore 1999). Affluent and free human populations like those of Germany, Switzerland and Japan have begun to shrink due to low-birth rates, especially affecting wealthy and educated strata. Chinese politicians enforced lower-birth rates, affecting the reproductive behavior of millions of people with some success – and some consequences of people's subsequent decisions not intended, like prenatal diagnosis and the subsequent abortion of girls. Started by orthodox rabbi Joseph Ekstein in Brooklyn in the 1980s, religious organizations like Dor Yeshorim offer genetic testing before marriage, successfully reducing rates of genetic disorders like Tay-Sachs in their communities (George 2004).

Humans "play" the same biological game of reproduction as animals, but they are able to weigh up paths in advance, their range of choices shaped by knowledge and culture. After numerous failed attempts to explain human reproduction the Malthusian way, scientific demography shifted to sociology and economics for decades. Today, demographic models are firmly based on humans calculating costs and benefits of parenthood in different settings. Studies compare the attributed "values of children" across countries and cultures (Nauck 2006).

But entering reproductive decision making, humans also have to solve motivation problems (births are known to be painful and sometimes dangerous, children are costly, etc.) and pending dilemmas of sexual cooperation, as they realize that they could be betrayed by unfaithful partners. Religiosity, understood as believing in supernatural guidance and surveillance of all parties involved, evolved (and evolves) as a biological and highly successful solution. Humans who are members of religious communities show statistically higher motivations towards marriage, children and family values, more cooperative orientation and finally higher reproductive success than their secular contemporaries.

8.2 Religious Activity and Reproductive Advantage

Fig. 8.1 Global correlation of worship attendance and number of children (Enste 2007)



There are obvious examples linking religious affiliation to reproductive success: orthodox Jewish communities attain far higher-birth rates than their secular neighbours in Israel or abroad. US-Amish and Hutterites have far more children than their rural contemporaries. National surveys allow probing into the influence of education or income – showing that the reproductive benefit of religious affiliation even tends to increase among the educated and wealthy risking more biographic options (cp. Birg 2004; Blume et al. 2006).

But there is even stronger data. Switzerland has been the only European country spared by any war for 160 years, becoming one of the wealthiest nations worldwide. Thankfully, the Swiss Statistic Office opened its treasure troves of the last census, conducted in the year 2000. It included a non-discriminating question relating to religious denomination, which was answered by 6,972,244 individuals amounting to 95.67% of the Swiss population.

We may compare the birth rates per woman of all religious denominations differentiated by the Swiss Statistic Office with more than 10,000 adherents. And in order to check two possible alternative explanations, we will test as well if these birth rates among religious communities might be determined by education or income levels of its members (Table 8.1).

The results are highly significant: women among *all* denominational categories give birth to far more children than the non-affiliated. And this remains true even among those (Jewish and Christian) communities who combine nearly double as much births with *higher percentages of academics and higher income classes* as their non-affiliated Swiss contemporaries.

Table 8.1 Birth rate per woman and religious denomination

Swiss Census 2000; denominational category	Births per woman	% Academic education	% Higher occupational class
Hinduism*	2.79 (1)	17.0% (12)	7.4% (14)
Islam*	2.44 (2)	11.4% (15)	6.1% (15)
Jewish	2.06 (3)	42.7% (1)	42.4% (1)
Independent protestant	2.04 (4)	20.1% (5)	19.2% (6)
New pietism/evangelical	2.02 (5)	19.2% (6)	17.9% (8)
Pentecostal	1.96 (6)	17.1% (11)	15.7% (10)
Other (smaller) Christian	1.82 (7)	39.1 (2)	31.8% (2)
Did not answer	1.74 (8)	19.1% (7)	5.3% (16)
Christian-orthodox*	1.62 (9)	18.0% (10)	9.8% (13)
Swiss average	1.43	19.2%	19.6%
Buddhist*	1.42 (10)	20.3% (4)	13.4% (11)
Roman catholic (M)	1.41 (11)	16.8% (13)	18.5% (7)
New apostolic	1.39 (12)	13.9% (14)	17.6% (9)
Protestant-reformed (M)	1.35 (13)	18.9% (8)	22.3% (4)
Yehova's witnesses	1.24 (14)	6.8% (16)	11.2% (12)
Christian-catholic	1.21 (15)	18.4% (9)	22.2% (5)
Non-affiliated	1.11 (16)	30.6% (3)	26.7% (3)
Spearman rank correlation (<i>r</i>)	–	0.054 (n. s.)	–0.269 (n. s.)
Data source – BFS 2004	p. 43	p. 117	p. 115

Categories marked by * are dominated by first-generation immigrants to Switzerland. Categories marked by an (M) have more than one million adherents.

Tested with the Spearman rank correlation coefficient, there remains *no* rank conjecture relating to the percentage of academics, as the Jews and some protestant minorities have begun to win and hold educated strata.

There is a slight negative rank correlation relating birth rates and career positions. Even as they have climbed the same educational classes as their secular contemporaries, religious parents seem to have sacrificed occupational options for the sake of children. That this does not indicate relying to traditionalism only is highlighted by the fact that very traditional and centralized communities like Yehova's Witnesses and the New Apostolic Church performed low in reproduction, whereas young and demographically thriving protestant minorities featured record rates of part-time working mothers (BFS 2004, p. 46).

As Friedrich August von Hayek, a Nobel Prize winner in economics was the first to assume (von Hayek 1982): religious communities tend to incorporate those "streams of tradition" which bestowed "reproductive benefits" to their adherents. These successful strategies emerge "not intrinsically, but historically" as a result of constant competition between religious communities and fractions in the fields of demography (von Hayek 1991). Wherever religious freedom is secured, thriving religions evolve and test new reproductive adjustments to changing environments, including family models, developments in gender relations and institutions of child care (cp. Adsera 2004). Under certain circumstances, family-oriented institutions upheld by celibate functionaries helped to improve mean reproduction and survival rates (Qirko 2004; Berman et al. 2007; Blume 2008).

8.3 The Religious Mind Promoting Reproductive Strategies

E.O. Wilson wrote, “that the brain exists because it promotes the survival and multiplication of the genes that direct its assembly. The human mind is a device for survival and reproduction and reason is just one of its various techniques.” (Wilson 1978).

Regarding planning abilities, it is not only the brain size that matters. Our brain volume is exceeded by whales and elephants by far. Uniquely large is the prefrontal cortex, the region above the eyes. As neurobiology discerned, our prefrontal cortices relate to calculating actions and delaying impulses, weighing strategic and moral dilemmas, guilt and remorse, acting socially oriented (“theory of mind”) and constructing biographic identities. People who are affected with frontotemporal dementia (Pick’s disease) lose social, lingual and emotional skills and happen to change their political and religious worldviews abruptly. Neuroimaging techniques observing people while praying or reading Holy Scriptures as well as studies related to effects of medical drugs and symptoms of Parkinson’s disease also support the thesis of a close connection among the prefrontal cortex and religious activity (Zimmer 2006; Harris and McNamara 2008; Harris and McNamara this volume).

What’s more, since the middle paleolithic, as the prefrontal cortices evolved along with biographic calculation and tool-using cultures among *Homo sapiens* and *Homo neanderthalensis*, both human species convergently evolved religious behavior like ritual burials and offerings (Stringer and Andrews 2005). The fact that recent Twin Studies discerned a moderate to high heritability coefficient of religiousness among recent *H. sapiens* supports the thesis of adaptive abilities evolved (and evolving) into human brain architecture (Koenig and Bouchard 2006; Harris and McNamara 2008; Bouchard this volume).

We might assume that early *H. sapiens* and *H. neanderthalensis* were beginning to face the very question of choices Darwin had to cope with.

During his biographical decision making, his religiosity (which he would partly abandon later in life) did not relate to any competition for survival, but to his personal motivation to reproduce. The young Darwin cited God as he pondered to have a family. This rings not only with the demographic data, but also with the fact that God’s first biblical words to mankind are “Be fruitful and multiply” (Gen. 1, 28), forming the first of all 613 commandments according to Jewish tradition.

Religious communities preaching family values with some success might be observed in everyday as well as in political life. Higher-birth rates of religious affiliated have been empirically verified globally (e.g. Inglehart and Norris 2004; Birg 2004; Newman and Hugo 2006, Philipov and Berghammer 2007; Frejka and Westhoff 2008; Pew 2008). For example, according to a representative survey conducted among younger people aged 16–29 years in Germany in 2006, 42% of the respondents who described themselves as non-religious said it was “important” to them to “have children “. Among the religious respondents, children were valued that way by 61% (Allensbach 2006).

Of course, there have also been communities hindering or even forbidding reproduction, e.g. the Shakers. At first glance, they seem to have a competitive advantage

as they could invest more resources into missionary work to win converts. But in the long run, mass conversions happen to be the historic exception, not the rule. Most of the time, only fractions of populations tend to convert from the religious mythology handed to them vertically by their parents (cp. Inglehart and Norris 2004; Stone et al. 2006) and they convert into different directions. But communities who start to lack young members also tend to lose their missionary appeal to other young people. Therefore, the Shakers inevitably over-aged and deteriorated. In contrast, the Mormons still flourish by having many homegrown members and sending them to missionary quests abroad. Orthodox Jews, Amish and Hutterites even stopped active proselytizing centuries ago, nevertheless growing in numbers by their high, reproductive performances. As assumed by von Hayek, the cultural history of religions is very closely linked to demography, contradictions being short-lived variants in religious competition.

The assumption that religious belief in supernatural truths and agents evolved in order to combine reproductive motivation with adaptive cooperation strategies converges fully with theses tracing early mythologies to exaggerated telltales and parental teachings (e.g. Dawkins 1976; Boyer 2001). But these random, biocultural epiphenomena became reproductively beneficiary by demographic competition, spreading successful aspects of lore and related neuronal preferences through thousands of generations (cp. von Hayek 1982; Boyer 2001; Blume 2008). As a consequence, anthropologists rightly deciphered established religious traditions as “descendant leaving strategies”, which intensified and expanded kin cooperation to larger groups of adherents as they were referring to shared (and later mythological) ancestors (Palmer and Steadman 2004; Palmer this volume). Even religions that abstain from calling God a parent (e.g. Islam) or are not theistic in orthodox theory (e.g. Buddhism, secular ideologies) frequently borrow familial terms like brother, sister, mother, father, uncle, etc. in order to emphasize kin-like, cooperative bonds. And burials remain the first archaeological traces of religious behavior, indicating faith in the enduring, supernatural existence of deceased.

Psychological experiments confirmed that children tend to believe in post-mortem existences intuitively – a concept which they partly lose with age and secular education (Bering et al. 2005). As adults were unconsciously primed with religious or civil religious terms, they tended to act more generously in dictator games (Shariff and Norenzayan 2006).

But these very results also highlight why religious minds and motivations cannot be biologically successful in isolation: reproduction itself, keeping the children alive, handing traditions abroad and building a favourable environment for subsequent generations are cooperative tasks from the very start. Individuals have to get access to reliable, communal sources of “streams of tradition” and to secure their religiously motivated, costly investments.

By deflecting exploiters and building trust, religious obligations and ritual behavior network the individuals into distinct communities, usually offering and rewarding competitively successful descendant leaving strategies, communal child-care and education and other cooperative gains (cp. Wilson 2002; Sosis and Bressler 2003; Newman and Hugo 2006; Berman et al. 2007).

8.4 Religious Behavior as Honest Signals

As any mammalian reproduction is associated with heavy costs and risks especially to the mothers, biologists are used to comprehend animal reproductive strategies by investment games leading retrospectively (that means: by relative success) to Evolutionary Stable Strategies.

But as soon as humans began to decide their pairing and reproduction strategies in advance, the setting changed to the prisoner's game with uneven stakes (McCain 2003). For women, the risk of defecting partners seeking reproductive chances otherwise instead of staying and contributing to the children has been a constant topic of human history. Men had to struggle with a certain insecurity of whether the children they were raising were their own offspring (cp. Voland 2007). Wrong choices could be crucial, as Johann Wolfgang von Goethe described in his classic "Faust". His young Margarethe (fondly called "Gretchen") was depicted after Susanna Brandt, whose death sentence Goethe had witnessed being a lawyer in Frankfurt. Lacking any supporting family or group, the orphan had been seduced and left by a travelling suitor, finally executing infanticide to her newborn in despair.

And what question did Goethe's Gretchen pose to Faust in order to assess his loyalty? "How is't with thy religion, pray?" – inviting disaster as she accepted Faust's blend of non-affiliated agnosticism and pantheism. It is Goethe's devil Mephistopheles, who clearly sees the correlation of "catechised" (that is, communally approved) religion to marital loyalty. Annoyed, he scoffs (Chap. XVI),

I've heard, most fully, how she drew thee.
The Doctor has been catechised, 'tis plain;
Great good, I hope, the thing will do thee.
The girls have much desire to ascertain
If one is prim and good, as ancient rules compel:
If there he's led, they think, he'll follow them as well.

We might remember that Emma Wedgwood probably would not have accepted Darwin if he had not been religious at the time of his courtship. Marriage contracts are cultural institutions to secure cooperation and to prevent betrayal. And among almost all cultures, marriage vows are accompanied by religious rites, regularly involving supernatural as well as natural witnesses.

And if there are communities around whose marriage vows are blessed by all-knowing, transcendent beings like the living dead or Gods punishing unfaithfulness in this life or the next, the "social control" is expanded and deepened beyond secular possibilities (cp. Bering et al. 2005). Therefore, women's preferences of religious communities and their sexual selection towards "catechised" men turns out to be evolutionary adaptive. We may test this by comparing all religious denominations not predominated by immigration in the Swiss Census 2000 (Table 8.2).

Swiss women not only dominate memberships in *all* major denominations. They significantly prefer those communities, where living together means to marry, where pairs tend to have children together and where divorce rates are low.

Table 8.2 Denomination and female membership

Swiss Census 2000 denominational	Female members (%)	Pairs married (%)	Pairs living with children (%)	Single parents (%)
Yehova's witnesses	57.4% (1)	99.3% (1)	53.3% (4)	5.2% (6)
Protestant-methodists	56.4% (2)	97.1% (5)	49.8% (8)	3.0% (1)
Smaller Christian	54.9% (3)	93.9% (6)	51.2% (6)	6.8% (7)
Pentecostal	54.6% (4)	98.5% (3)	63.8% (2)	5.1% (5)
Independent protestant	54.6% (5)	97.8% (4)	59.4% (3)	4.2% (4)
New apostolic church	54.1% (6)	91.1% (8)	44.6% (9)	5.9% (10)
Christian-catholic	53.9% (7)	89.4% (10)	41.7% (11)	5.6% (9)
Evangelicals	53.5% (8)	98.9% (2)	65.6% (1)	5.9% (10)
Protestant-reformed (M)	52.7% (9)	88.2% (11)	44.0% (10)	5.4% (7)
Roman catholic (M)	51.6% (10)	89.8% (9)	51.4% (5)	5.5% (8)
Judaism	51.0% (11)	93.9% (7)	51.0% (7)	6.3% (11)
Swiss average	51.0%	89.0%	48.5%	5.8%
Non-affiliated	45.9% (12)	81.5% (12)	40.0% (12)	7.8% (12)
Spearman rank correlation (<i>r</i>)		0.696* (<i>p</i> < 0.05)	0.622* (<i>p</i> < 0.05)	0.378 (n. s.)

Categories marked by an (M) have more than one million adherents.

In contrast, the non-affiliated form the single category dominated by men, featuring the lowest percentage of married couples, the lowest percentage of pairs with children and (although characterized by the lowest rate of marriages and births) having the highest percentage of divorcees and mothers raising children alone.

Therefore, we should not be too surprised to find women attracted to religious movements like patriarchal monotheisms, which did not and do not exactly promote self-actualization and gender mainstreaming. Men might perceive religion as a stage to earn status and therefore to win economic and reproductive chances. But women tend to prefer communities and prospective husbands sending honest signals of familial cooperation. We might be fascinated by the Kung San-Num healing dancer role only accessible to men by long, demanding and dangerous initiation. These costly requirements secure the trustworthiness of the dancers, as obligations and rituals secure the longevity of religious communities abroad (Sosis and Bressler 2003). But we should not overlook the fact that the women behold the performers, sitting in the middle, singing and clapping the tune. Although the Bible clearly indicates that Adam "recognized" Eve, she thanks God for the birth of her child (Gen 4, 1). The Lord is even reported to have slain two sons of Judah before humiliating the patriarch himself while siding with a foreign woman, Tamar, for rightfully insisting on her marriage contract (Gen 38).

Evolutionary findings linking religiousness to survival gains of health, power, trust-building and economic enhancements are complementary to this thesis. But as the communal decline of the long-lived, healthy and economically prosperous Shakers shows, religions inevitably perish if they deviate too long from their main task: competitive, reproductive performance. From an evolutionary perspective, survival without reproduction is a dead end.

8.5 Conclusion

After the Scopes Trial in 1925 and the subsequent establishment of evolutionary theory in state schools in the United States, there was a broad conviction among educated Westerners that the defeat of anti-evolutionist fundamentalism and probably all religion was a matter of time. But to the great surprise of many, religious activity including Creationism and Intelligent Design today enjoy a worldwide resurgence. The reason is simple: evolutionary theorists brought up far more scientific arguments – but committed believers in supernatural agents brought up far more children.

There is a certain irony in here: creationist parents unconsciously defend the reproductive success of their children and communities against evolutionist teachings, whereas some naturalists are trying to get rid of our evolved abilities of religiosity by quoting biology. But from an evolutionary as well as philosophic perspective, it may seem rather odd to try to defeat nature with naturalistic arguments.

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