



2018

# Evolution Belief Trends

Jamie Jensen  
jamie.jensen@byu.edu

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## BYU ScholarsArchive Citation

Jensen, Jamie, "Evolution Belief Trends" (2018). *ScholarsArchive Data*. 6.  
<https://scholarsarchive.byu.edu/data/6>

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Data files included:

### **Cohort 1 pre:post Essay Frequencies**

Table 1 shows the frequency of essays in the Bio 100 cohort from 1988 – 1994.

Table 2 shows the frequency of essays in the Bio 100 cohort from 1988 by itself and then from 1989 – 1994.

### **Cohort 2 2014 essay data**

This shows the pre and post essay codes for the first round of Cohort 2, which occurred in 2014.

### **Cohort 2 2016 essay data**

This shows the pre and post frequencies for the essays of the much larger portion of Cohort 2, which occurred in 2016.

### **Cohort 2 PreSurvey**

This includes the raw survey data for Cohort 2 taken at the beginning of the semester. Codes in Row 1 correspond to the following questions:

What is your current age?

2. Did your parents attend or graduate from BYU?
  - a. Father, attend
  - b. Father, graduate
  - c. Mother, attend
  - d. Mother, graduate
3. What courses have you taken in high school? (Check all that apply.)
  - a. Earth Science
  - b. General biology
  - c. AP biology
  - d. Specialty biology (e.g. marine, environmental, etc.)
4. On a scale of 1-10 (1 = poor; 10 = great), how much did you enjoy your high school biology course(s)?
5. Did your high school biology course offer strong coverage of the topic of evolution?
  - a. Strong coverage
  - b. Weak coverage
  - c. No coverage
6. Apart from covering the subject of evolution did your teacher reveal (perhaps inadvertently) a personal bias about evolution?
  - a. A skepticism about the validity of evolution.
  - b. A feeling that there might be a religious conflict about evolution
  - c. An atheistic attitude about the absence of deity in the evolutionary process.
  - d. A neutral attitude; no bias about the consequences of evolutionary principles

7. What was your reaction to the topic of evolution as taught in your high school biology course?
  - a. Acceptance without conflict
  - b. Concern about the validity of evolution
  - c. Feelings of mild conflict because of religious doctrine
  - d. Feelings of severe conflict leading to rejection of evolution
  - e. Feelings of neutrality; no strong reaction either way
  
8. Was evolution ever discussed in your LDS seminary classes?
  - a. No
  - b. Yes. I came away with the feeling that the Church opposes evolution.
  - c. Yes. I came away with the feeling that the Church doesn't have a position on evolution.
  - d. Yes. I came away with the feeling that science, including evolution, and religion are compatible with one another.
  - e. Something else
  
9. Which of the following statement comes closest to your views on the origin and development of human beings?
  - a. Human beings have developed over millions of years from less advanced forms of life, but God guided this process.
  - b. Human beings have developed over millions of years from less advanced forms of life, but God had no part in this process.
  - c. God created human beings pretty much in their present form at one time within the last 10,000 years or so.
  
10. Have you heard about, or read, the book *Man His Origin and Destiny*, by Joseph Fielding Smith?
  - a. Yes
  - b. No
  
11. Have you heard about, or read, the book *Mormon Doctrine*, by Bruce R. McConkie?
  - a. Yes
  - b. No
  
12. Have you heard about, or read, the "BYU Packet on Evolution?"
  - a. Yes
  - b. No
  
13. Have you recently heard or read a statement by a current LDS leader/authority that expressed negative sentiments about evolution?
  - a. Yes
  - b. No

14. Was the teaching of evolution a controversial issue in your family?
  - a. Yes
  - b. No
  
15. How much do you think your parent's opinion of evolution has influenced your own views on the subject?
  - a. Very strongly influenced
  - b. Somewhat influenced
  - c. Influenced very little
  
16. How much do you think your parent's opinion about evolution has been influenced by their own educational experience?
  - a. Very strongly influenced
  - b. Somewhat influenced
  - c. Influenced very little
  
17. Was the teaching of evolution a controversial issue in your community or state?
  - a. Yes
  - b. No
  
  
18. What is your opinion about teaching the concept of Intelligent Design in a biology course?
  - a. I approve
  - b. I disapprove
  - c. I am ignorant about the concept of Intelligent Design.
  
19. What is your opinion about parents who do not vaccinate their children because they believe vaccination may lead to autism?
  - a. I agree with such parents.
  - b. I disagree with such parents.
  - c. I have no opinion on this issue.
  
20. What is your opinion on the issue of climate change?
  - a. Climate change is real; the earth is warming due to human activity.
  - b. There are no valid data suggesting that climate change is real.
  - c. I have no opinion on this issue.
  
21. Because of their professional emphasis on reason and empirical observation, it is generally more difficult for people trained in science to maintain religious faith.
  - a. True
  - b. False
  
22. The concepts of science are frequently in conflict with the revealed word of God.
  - a. True
  - b. False

23. The technological and scientific advances of the past centuries have changed the world. There are many negative consequences of this, however, because the changes wrought by science are often unnatural. For example, synthetic fertilizers, refined food, food preservatives, and insecticides are not part of the natural world and are incompatible with it. As a result, mankind suffers.
- I agree
  - I disagree
24. Extensive testing by the United States government has shown the drug Laetrile (an extract from apricot pits) to be ineffective in the cure of cancer. The drug cannot be legally used in the United States; it is legal in Mexico. Do you agree with the following statement?
- “The ban on Laetrile should be lifted. People should be allowed to exercise their own agency in using the material, even though tests have proven it is without value”
- I agree
  - I disagree
25. It is immoral to tamper with human genes by altering, adding to, or eliminating part of the complement of DNA that an individual has inherited over generations by natural means.
- I agree
  - I disagree
26. The United States Patent and Trademark Office has ruled that higher life forms – even mammals – produced by genetically engineering DNA sequences may be patented. Industrial leaders are pleased and see the ruling as helping to protect their investments. Critics express anxiety about the safety and morality of tampering with life forms. Do you agree that commercial companies ought to be able to patent such organisms?
- Yes
  - No

### **Cohort 2 Post Survey**

This includes the raw survey data for Cohort 2 taken at the end of the semester. Codes in Row 1 correspond to the following questions:

Q1 This questionnaire assesses your understanding of and opinions about ecological and environmental issues.

For each question below select the *one* response which best represents your personal point of view.

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Q2 Which of the following best represents your personal view about the environmentalist movement?

- Environmental organization, such as the Sierra Club, provide a valuable service in helping protect the environment. (1)
  - Governmental agencies (federal and state) are the only organizations needed to protect the environment. (2)
  - Local governments can adequately handle environmental crises. (3)
  - Environmental organizations, in general, have caused more problems than they have solved by preventing governmental agencies from performing their duties, by hampering growth and development, and by preventing sportsmen from utilizing game species. (4)
  - I have no interest in the environmental movement. (5)
- 

Q3 Which of the following do you consider to be the major environmental problem of the current decade?

- The loss of wilderness areas. (1)
  - Air and water pollution. (2)
  - The extinction of species. (3)
  - Growth of the human population. (4)
  - There are no major environmental problems in the current decade. I am tired of hearing about environmental problems. Besides, economic problems are more important than environmental issues. (5)
-

Q4 Which of the following best represents your personal view about the growth of the human population?

- The earth has a carrying capacity and there is a limit to the number of humans that can be supported. (1)
  - There is no limit to how many humans can be supported on this earth. Modern technology will supply the necessary food and energy. (2)
  - We should be concerned with human population growth in underdeveloped countries. In such countries, family size should be limited. (3)
  - Growth should be limited in all countries. (4)
  - None of the above. (5)
- 

Q5 Which of the following best represents your personal view about preserving certain locations in the country as wilderness areas.

- The concept of wilderness areas is valid, but the areas presently designated as wilderness areas are inadequate. (1)
  - The concept of wilderness areas is valid. The balance between wilderness and developed land is currently adequate. (2)
  - Wilderness areas should be reduced to those areas enclosed within national park boundaries. (3)
  - Wilderness areas as now defined should be eliminated. These areas should be opened up to grazing, all-terrain vehicles, etc. (4)
  - None of the above. (5)
-

Q6 Which of the following best represents your personal view about the possibility of future oil and gasoline shortages?

- There is no real oil shortage. Oil companies circulate false information and manipulate supplies in order to drive up prices and increase their profits. (1)
  - There are large reserves of fossil fuel in the earth which have not yet been tapped. These will meet every conceivable energy need, world wide, for hundreds or thousands of years to come. (2)
  - Engineering technology will come to our aid and provide synthetic fuel alternatives (or other scientific solutions) which will meet our future needs and permit us to maintain our present levels of energy consumption. (3)
  - The oil shortage is real. Gasoline prices are likely to rise dramatically within a few years and a realistic projection of the not too distant future is a reduction in the oil-dependent lifestyle of people in industrial nations. (4)
  - I have no opinion on this issue. (5)
- 

Q7 Which of the following best represents your personal view about conflicts between a biological interest (preserving from extinction a rare species of fish) and economic development (building a dam or a road)?

- Economic development has the highest priority. Mankind was given dominion over all the earth and we have greater value than lesser animals. Fish are expendable if they stand in the way of progress. (1)
  - Such conflicts are seldom if ever real. The biological interests are not based on real data and their importance is blown out of proportion. Ecologists are generally obstructionists who should be disregarded most of the time. (2)
  - Humans should consider their species an integral part of an ecosystem and realize their dependence on other organisms. Compromises should be sought (even if there is a higher cost, for example, by rerouting a road to a less convenient location). (3)
  - Preserving endangered species has the highest priority. Man's stewardship of the earth requires us to resist the extinction of any life form, an event which must be considered an unnatural, unnecessary tragedy. (4)
  - I am completely neutral on this issue. (5)
-



Q8 In your view, which best represents the official position of the Church of Jesus Christ of Latter-day Saints toward the environment?

- The environment is for people to use as they please. There should be no federal or state regulations governing how land and resources should be used. (1)
  - Every person is a steward over a portion of this earth. This stewardship implies that man will be held responsible for the ecological state of the earth. (2)
  - Active Latter-day Saints have no reason to belong to environmental groups. If man lives righteously, the ecological state of the earth will be sufficient to support man's activities. (3)
  - There is no official church position concerning the environment or ecology. A wide difference of opinion exists among both church leaders and members on the subject. (4)
  - None of the above. (5)
- 

Q9 Indicate your opinion (agree or disagree) on the following issue:

"Under no circumstances should additional nuclear power plants be constructed. Their cost is prohibitive and they pose a very significant health and safety risk."

- Agree (1)
  - Disagree (2)
- 

Q10 Indicate your opinion (agree or disagree) on the following issue:

"The Environmental Protection Agency (EPA) performs a vitally important function in the United States today. Its activities must be supported and maintained."

- Agree (1)
  - Disagree (2)
-

Q11 Indicate your opinion (agree or disagree) on the following issue:

"Industries which pollute the air and water should be fined and made to comply with government regulations even if the cost for doing so may drive them out of business."

Agree (1)

Disagree (2)

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Q12 Indicate your opinion (agree or disagree) on the following issue:

"Economic growth is vital to the future of the State of Utah. We need to attract more people and more industries. The Wasatch Front can accommodate at least a doubling of its current population without any significant threat to the environment or our current standard of living."

Agree (1)

Disagree (2)

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Q13 Indicate your opinion (agree or disagree) on the following issue:

"Depletion of the ozone layer in the upper atmosphere is a very real and serious problem whose solution deserves high priority among our national/international concerns."

Agree (1)

Disagree (2)

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Q16 Below is a survey about your understanding of and opinions about evolution. Please mark the *one* response that best represents your personal view point.

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Q17 Which of the following best represents your overall personal view about the concept of biological evolution?

It is a repulsive notion. I find it demeaning and degrading and resent the suggestion by misguided individuals that I am related to apes or single-celled organisms. (1)

I reject it as being illogical. It is too far-fetched to be believed. It is only a theory based on conjecture. When all the real facts are in, evolution will be disproved. (2)

I reject evolution because it is in direct conflict with my religious faith. One cannot reconcile such a view of the origin and development of life with believe in a divine creator. (3)

Evolution might apply to some limited circumstances, but cannot be a general principle. (Evolution does not occur across the boundaries which separate the major categories of plants and animals. It may apply to lower forms but not to man.) (4)

I accept the bulk of evolutionary ideas as true, but I don't know how to reconcile them with religious concepts I also believe to be true. This is unsettling and I find myself confused. (5)

I accept evolution as a true principle. There is strong evidence to support the concept, and I do not find it in conflict with my religious faith. (6)

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Q18 Which of the following represents your personal view about the scientific status held by evolution? What place does it hold in the hierarchy between absolute truth and falsehood?

- Evolution is a law, an absolute principle whose mechanisms and consequences are completely defined. (1)
  - Evolution is a theory, meaning a concept consistent with a large body of evidence which best explains the diversity of life on earth and continues to stand the test of time and new data. (2)
  - Evolution is a theory, meaning an unproven assumption or mental speculation. There is not yet enough evidence to consider evolution a valid principle. (3)
  - Evolution is a postulate, a loose proposal about which there is little agreement among experts. (4)
  - Evolution is a fraud. It is a deliberate misrepresentation of the truth without any basis in fact. (5)
- 

Q19 What or who has been the strongest influence on you in the formulation of your opinion about evolution?

- My parents (1)
  - Sunday school/ Seminary teachers, church leaders (2)
  - Peers/Friends (3)
  - Courses/teachers in school (4)
  - My own personal study and thought (5)
- 

Q25 Are you a first-generation college student? (i.e., neither of your parents attended a college or university of some sort)

- Yes (1)
  - No (2)
-

Q26 If either or both of your parents attended BYU, did either or both of them study a major within or related to the life sciences (e.g., biology, microbiology, zoology, health, nursing, etc.)?

- Yes (1)
  - No (2)
  - Neither of my parents attended BYU (3)
- 

Q27 Are either or both of your parents in a life science profession? (e.g., Doctor, dentist, nurse, research scientist in the life sciences, etc.)

- Yes (1)
  - No (2)
- 

Q20 How well informed are you on evolution? (To what degree have you studied the biological propositions and their philosophical consequences?)

Almost totally ignorant      Very well informed  
0      1      2      3      4      5

Move the slider to indicate your response ()	
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Q21 Which of the following best represents your personal view about the age of the earth?

- Relatively short (based on a literal interpretation of Genesis: each day of creation = 24 hours) (1)
  - A few thousand years (based on the interpretation of the scripture such that "1 day with God = 1,000 years with man"). (2)
  - A few thousand years (based on the view that scientific dating techniques are inaccurate.) (3)
  - Very long, 4.6 billion years (Based on the most widely accepted scientific estimate). (4)
  - None of the above (5)
- 

Q22 Which of the following best represents your view about fossils and other geological evidence which are cited in support of evolution?

- Such evidence is weak and not compelling. It is too fragmentary and incomplete to justify the speculative conclusions usually drawn from it. (1)
  - Such objects were placed on the earth by God as a test of the faith of human beings. (2)
  - Such objects were arranged on the earth by Satan in order to destroy the faith of human beings. (3)
  - Such evidence is widespread and accurate and validates the concepts of evolution. (4)
  - I have no opinion on this matter. (5)
- 

Q23 In June 1987 the United States Supreme Court ruled unconstitutional a Louisiana state law (The Balanced Treatment Act) which required that if evolutionary theory was taught in the

public classroom, equal time must also be given to the presentation of creationism. Which of the following best describes your personal reaction to this decision?

- I approve. The teaching of fundamentalist religious ideas in the school would violate the principle of separation of church and state. (1)
  - I disapprove. Evolution is an atheistic concept. To teach it in the public schools contributes to the breakdown of the values I hold dear. (2)
  - I disapprove. Equal time ought to be granted to opposing points of view on controversial issues. (3)
  - I'm neutral. I've listened to both sides of the argument and don't have strong feelings either way about the issue. (4)
  - I haven't paid any attention to the issue; it doesn't hold much interest for me. (5)
- 

Q24 In your view, which statement below best represents the official position of the Church of Jesus Christ of Latter-day Saints toward the principle of biological evolution?

- The official position of the Church is that evolution is incorrect. The idea is not in harmony with statements of the scriptures and church leaders, and is harmful to the spiritual growth of church members. (1)
- The official position of the Church is that evolution is correct. It is scientifically sound and compatible with the principles of the gospel. (2)
- There is no official position of the Church concerning evolution. A wide difference of opinion exists among both church leaders and members on the subject. (3)
- None of the above. (4)