

# Atheists' Knowledge About Science and Evolution

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*American atheists understand the essence of science, are knowledgeable about evolution and well informed about the controversy over evolution versus creationism versus Intelligent Design.*

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Because previous studies have demonstrated high knowledge among atheists about American history, literature, politics, the role of religion in public life, and awareness about world religions, we hypothesized that atheists understanding of science, evolution, and the controversy over evolution versus various forms of supernatural causation (including traditional creationism or modern Intelligent Design) would be equally high. Here we report on the most significant findings of polling atheists on these subjects.

During the first two weeks of November 2011, we surveyed 133 atheists, non-believers and agnostics native to 35 states in the United States. Three hundred and thirty two members of *Atheist Alliance of America (AAAmerica)* received an email invitation to participate in an online anonymous and voluntary survey --40% of the contacted individuals responded.

## Responders Profile

Among responders, 86.7% considered themselves to be atheists, 11.1% non-believers, and 2.2% agnostics; 71.6% were males and 28.4% females. Although their ages varied from -20 to 60+, most responders were mature adults with over four decades of life experiences, as follows: 60+ (39.0%), 50-59 (22.7%), 40-49 (19.9%), 30-39 (14.2%), 20-29 (3.5%), and below 20 years (0.7%).

In terms of cultural and ethnic backgrounds, 93.6% identified themselves as "Caucasian" and 6.4% as "other," including Hispanic, multicultural, and Asian Pacific. Responders born in the United States selected 35 states as "place of birth" and only 8 responders selected other countries as place of birth.

When asked about their political ideology, 39.7% chose progressive, 35.5% liberal, 14.2% moderate, 7.8% other, and 2.8% conservative. Their partisanship identification was: 56.0% democrat, 19.1% independent, 13.5% unaffiliated, 6.4% libertarian, 4.3% Green, and 0.7% republican and other.

Three quarters of the responders had, at least, college education or beyond: 27.7% bachelors degrees, 26.2% masters, 12.8% associate or technical degrees, 11.3% PhD, 9.2% doctoral or equivalent, 7.1% high school, 5.7% professional degrees.

## Responses to the Survey

Here we summarize the responses to the questions pertinent to understanding of science, evolution and the controversy over evolution versus creationism versus Intelligent Design:

### *Controversy Evolution vs. Creationism*

Most responders indicated to be very concerned (90.1%) and a few somewhat concerned (6.4%) about the controversy "evolution versus creationism versus Intelligent Design" and its implications for science education. Only 2.1% considered the debate to be trivial, and 1.4% was not concerned about the debate.

### *Intelligent Design (ID)*

Two in every three responders considered Intelligent Design (ID) to be religious doctrine consistent with creationists' views, and one in every three responders considered ID to be not scientific and to have been proposed to counter evolution based on false claims, as follows: ID is religious doctrine consistent with creationism 61.7%, ID is not scientific but has been proposed to counter evolution based on false claims 37.6%, and no opinion 0.7%.

### ***The Teaching of Evolution***

Almost all responders (98%) considered that evolution alone should be taught in science classes, and only two in every one hundred responders favored equal time to evolution, creationism and ID, as follows: evolution 97.9%, equal time to evolution, creationism and ID 2.1%.

The majority of responders disagreed with the statement that “*It is possible to offer an excellent biology course that includes no mention of Darwin or evolution,*” as follows: strongly disagreed 88.9%, disagreed 7.4%, did not know 2.2%.

### ***Evolution and Responders Reaction to It***

Almost all responders (99.3%) reacted positively to the statement “*Hearing about evolution makes me appreciate the factual explanation about the origin of life on Earth and its place in the universe,*” and only a fraction of responders (0.7%) had no opinion about it.

### ***Acceptance of Evolution***

In the key question: “*Do you accept evolution openly regardless of others opinions?*” Most responders (93.3%) agreed with the statement; however, 5.2% admitted to accept evolution in private and to not discuss it openly to avoid conflicts with friends and family. Only 1.5% of responders preferred to not give an opinion on this topic.

### ***Evolution Among All Sciences***

When asked to assess the statement “*Evolution is the unifying theme of all sciences,*” two in every three responders agreed with this postulate, as follows: strongly agreed 43.0%, agreed 27.3%, disagreed 19.3%, did not know 10.4%, strongly disagreed 3.7%.

### ***How Science Works***

Participants in the survey were asked to assess various statements about “*how science works*” and select if they considered the postulates to be true (agree with them) or false (disagree with them); below we report the responses as either “*correctly agreed or disagreed*” with each postulate, as follows:

“*Scientific theories are based on opinions by scientists*”: Correctly Disagreed 85.9%

“*Scientists use statistics to assess the probability of occurrence of a phenomenon in respect to random chance*”: Correctly Agreed 89.6%

“*Science relies on experimentation to test claims*”: Correctly Agreed 97.8%

“*A scientific argument is as valid and respectable as its non-scientific counterpart*”: Correctly Disagreed 61.5%

“*Crime-scene and accident-scene investigators use a different scientific method to investigate a crime or an accident*”: Correctly Disagreed 86.7%

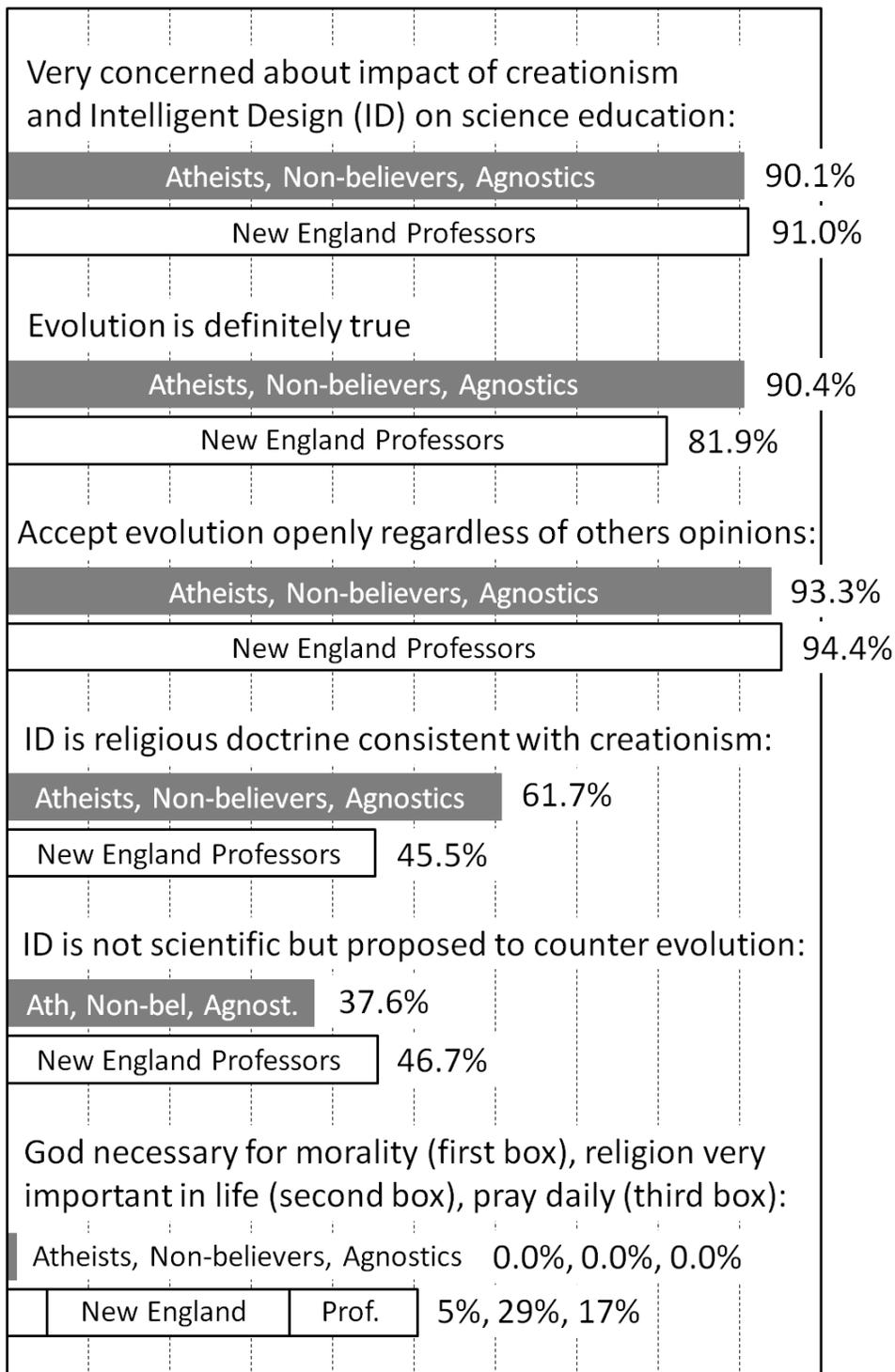
### ***Definitions of Evolution***

As in above, participants were asked to assess various statements about “*evolution is...*” and select if they considered the postulates to be true (agree with them) or false (disagree with them), as follows:

“*Gradual process by which organisms acquire beneficial traits during their lifetimes --such as longer necks, larger brains, resistance to parasites-- and pass on these traits to their descendants*”: Correctly Disagreed 48.1%. Note that agreeing with this statement would suggest a Lamarckian understanding of evolution, which is incorrect.

“*Gradual process by which monkeys --such as chimpanzees-- turn into humans*”: Correctly Disagreed 96.3%

“*Random process by which life originates, changes, and ends accidentally in complex organisms such as humans*”: Correctly Disagreed 69.6%



**Figure 1.** Summarized responses of atheists, non-believers and agnostics to the survey; for comparison, responses by the highly educated New England professors are included.

**Think Evolution Is...**

When asked to assess the reality of evolution, 90.4% of the responders considered evolution to be definitely true; 8.9% probably true, and only 0.7% did not respond to this question.

## ***On Faith, God, Religion and Prayer***

To confirm that responders to the survey were atheists, non-believers or agnostics, we asked them to assess three crucial statements concerning religiosity, to which they responded as follows: “*Faith in a God is necessary for morality*”: disagreed 100%; “*Religion is very important in my life*”: disagreed 100%; and “*I pray at least once a day*”: disagreed 100%.

## ***On The Evidence For Evolution***

As in above, participants were asked to assess various statements concerning “*the evidence for evolution*” and select if they considered the postulates to be true (agree with them) or false (disagree with them), as follows:

“*All currently living organisms are descendants of common ancestors, which have evolved for thousands, millions, or billions of years*”: Correctly Agreed 97.0%

“*The hominid (human lineage) fossil record is so poor that scientists cannot tell with confidence that modern humans evolved from ancestral forms*”: Correctly Disagreed 99.3%

“*The origin of the human mind and consciousness cannot be explained by evolution*”: Correctly Disagreed 96.3%

“*Humans are apes, relatives of chimpanzees, bonobos, gorillas and orangutans*”: Correctly Agreed 76.3%

“*The universe, our solar system and planet Earth are finely tuned to embrace human life*”: Correctly Disagreed 84.4%

## ***On the Earth, the Moon, the Continents***

Finally, as in above, participants were asked to assess various statements concerning “*the Earth, the moon, the continents*” and select if they considered the postulates to be true (agree with them) or false (disagree with them), as follows:

“*The Earth and its moon are several billions of years old*”: Correctly Agreed 99.3%

“*In planet Earth, the continents constantly move; this phenomenon has occurred over millions of years*”: Correctly Agreed 98.5%

## **Conclusions**

The atheists, non-believers and agnostics who responded to our survey were knowledgeable about the foundations of science, evolution and the public controversy over acceptance of evolution and its teaching in the United States. In Figure 1 we summarize some of the relevant findings of this survey and compare atheists’, non-believers’ and agnostics’ responses to those of the highly educated professors of New England (N=244, data from [Paz-y-Miño-C & Espinosa. 2011. New England Faculty and College Students Differ in Their Views About Evolution, Creationism, Intelligent Design, and Religiosity. \*Evo Edu Outreach\* 4: 323-42](#)), whose knowledge about science and evolution is the highest nationwide and their religiosity the lowest among US scholars. Note that the figure does not imply that atheists, non-believers and agnostics in our survey have equal training in the sciences as the professors, but simply that in the questions here reported both groups are comparable, except for religiosity which, among atheists, non-believers and agnostics, is 0.0%.

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