

Acceptance of Evolution Among American College Students

Manuscript for presentation at the National Association for Biology Teachers meeting

Acceptance of Evolution Among American College Students at Two Arkansas Regional Universities

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Keywords: Evolution, acceptance of evolution, religion, freshman biology course

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Introduction

Why is there resistance to teaching evolution in the public school system? Why does the public want to ban the teaching of evolution in school in favor of Creationism? These are some recent headlines from various media formats in the United States (Prang 2014, NCSE 2014, Kopplin 2014, and NCSE 2015). Gallup Poll results (Newport, 2014), reveal that 42 percent of Americans reject human evolution in favor of Creationism as the explanation for life on Earth. Regularly introduced legislation challenges the validity of evolution education by either preventing evolution from being taught in the classroom, or by giving parents the option for their children to “opt out” of evolution instruction (NCSE, 2017). Even though evolution is the unifying theme of biology (Dobzhansky, 1973, Rutledge & Mitchell, 2002, Trani, 2004, Berkman, 2004, Moore & Kraemer, 2005, Rutledge & Sadler, 2007, Bland & Moore, 2011, NCSE, 2013), many students have nonscientific beliefs about life’s origins and evolution (Moore, et al. 2006).

This research focuses on acceptance rates of evolutionary theory by college students enrolled in introductory biology courses. Three semesters of data were collected from students enrolled in freshman-level majors and non-majors biology courses at Arkansas Tech University (ATU) and at the University of Central Arkansas (UCA). The primary goal of this research was to identify relevant demographic factors affecting acceptance of evolutionary theory in the Mid-south. It is hoped that a better understanding of these factors will lead to the development of strategies to increase the understanding and acceptance of evolution. Understanding students’ perceptions of core scientific principles for the purpose of science education reform and continued incorporation of current scientific knowledge in the public school system is key (Paz-y-Mino and Espinosa, 2008). Some of the demographic factors this research examined were the effects of 1) age; 2) religious background; 3) high school science experiences.

The hypotheses of this study were 1) certain demographic factors play a significant role in students’ acceptance of evolution, and 2) students whose high school biology teachers either excluded evolution or offered creationism as an alternative to evolution have lower rates of acceptance and understanding of evolutionary principles as first-year college students.

A pre-test/post-test design was utilized for this research. A survey instrument was administered to college students enrolled in introductory majors and non-majors biology classes at the beginning and end of the semester. Paired samples t-tests and Pearson’s R were calculated to determine significance and correlations on rates of acceptance of evolutionary theory before and after exposure to evolutionary concepts during the course. Results of these surveys were not made available to the researcher until the semester following data collection.

This research represents a quantified assessment of students’ rejection of evolutionary theory in favor of nonscientific creationist views. These results also may indirectly reflect the level of adherence to the state science standards in the public school systems in Arkansas. When teachers do not follow state science standards, they are not fully preparing their students for success in college. Undergraduate students are commonly required to complete a laboratory science course, and many enroll in either a non-majors or majors biology course which includes evolutionary theory as a unifying concept. Educators are responsible for ensuring that accurate scientific knowledge is passed to future generations to promote understanding and scientific advancement for the future.

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Materials and Methods

Institutional Review Board (IRB) approval was obtained prior to data collection. An informed consent agreement was included as part of the survey. Student participants were verbally informed of the purpose of this research and were told that participation in the study would not affect their course grade. To limit bias, the researcher did not view the participating students' surveys until the following semester. A total of 993 pre-test and 534 post-test surveys were examined for this research.

Students enrolled in freshman level biology courses at ATU and UCA were administered a survey at the beginning and end of the semester. Surveys were administered during the Fall 2013, Spring 2014, and Fall 2014 semesters at ATU and UCA. Students' participation was voluntary.

The survey instrument (Appendix A) was comprised of demographic items (age, gender, race, religious affiliation, public or private high school, and their chosen major) and Likert-scale questions which asked participants about their high school experiences regarding the instruction they received on evolutionary theory and other issues. The Measure of the Acceptance of the Theory of Evolution (MATE), developed by Rutledge and Sadler (2007) comprised the remainder of the instrument. The MATE includes 20 five-point, bi-directional Likert-scale items ranging from Strongly Agree to Strongly Disagree. The MATE was originally designed to assess high school science teachers' levels of acceptance of evolutionary theory (Rutledge, 1999). MATE items fall into six themes: the processes of evolution, the scientific validity of evolutionary theory, evolution of humans, evidence for evolution, the scientific community's view of evolution, and age of the Earth. Rutledge's initial field test for the MATE (1996) was used to develop a scoring system with scores that range from 20-100 (Table 1).

Survey data was tabulated and analyzed statistically using mean MATE scores. P-value ANOVAs were calculated for significance, and Pearson's R correlations between significant demographic groups were also calculated.

Table 1

MATE Score Range and Corresponding Acceptance Rates of Evolutionary Theory and Core Scientific Concepts

Acceptance Rates	Score Range
Very High Acceptance	89-100
High Acceptance	77-88
Moderate Acceptance	65-76
Low Acceptance	53-64
Very Low Acceptance	20-52

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Abbreviations included in the following tables are as follows:

MATE Survey Question Categories	Question Number on MATE
M1: Processes of Evolution	1, 9, 18, 19
M2: Scientific Validity of Evolutionary Theory	2, 10, 12, 13, 14, 20
M3: Evolution of Humans	3, 15
M4: Evidence of Evolution	4, 6, 8, 16
M5: Scientific Community's View of Evolution	5, 17
M6: Age of the Earth	7, 11

Abbreviations included in the following tables are as follows:

Background Survey Question Categories	Question Number on Background Survey
B1: Student's Religiosity	1-8
B2: Creationism in High School	9, 10, 12
B3: Evolution in High School	11, 13-16

Results

Objective 1: Majors vs. Non-majors

Mean MATE scores were compared between majors and non-majors pre- and post-test survey analysis. An increase in average MATE pre- to post-test scores was observed for non-majors (See Table 2) with little change overall in the majors results.

Table 2

Mean MATE scores and Standard Deviations Comparing Biology Majors with Non-majors

	Pre-test	n	SD	Post-test	n	SD
Majors	67.44	314	15.14	69.07	103	16.09
Non-majors	63.83	683	15.02	66.13	431	15.09

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Analysis of mean pre-test MATE scores revealed significant differences between biology majors and non-majors ($p=0.00$), with biology majors showing higher rates acceptance. However, analysis of mean post-test MATE scores revealed no significant difference ($p=0.09$) between biology majors and non-majors. Significant differences were found between majors and non-majors for all six MATE themes on the pre-test scores, with biology majors showing higher rates of acceptance. No significant differences were detected for questions regarding the age of the Earth between biology majors and non-majors on the post-test survey (Table 3).

Table 3

*Mean, Standard Deviations, and P-values of MATE Themes
Majors vs Non-majors on the Pre- and Post-test Surveys ($N \geq 30$)*

<i>Pre-Test Survey</i>					
Category	Majors		Non-Majors		p-value
	Mean	SD	Mean	SD	
M1: Processes of Evolution	67.25	15.26	62.61	15.02	0.01
M2: Scientific Validity of Evolutionary Theory	66.09	15.75	61.84	14.96	0.01
M3: Evolution of Humans	16.52	3.94	15.46	3.74	0.00
M4: Evidence of Evolution	65.90	14.87	61.54	14.69	0.02
M5: Scientific Community's View of Evolution	66.27	15.00	62.03	14.69	0.00
M6: Age of the Earth	66.63	15.18	61.30	14.59	0.01

<i>Post-Test Survey</i>					
Category	Majors		Non-Majors		p-value
	Mean	SD	Mean	SD	
M1: Processes of Evolution	69.23	15.63	65.31	15.38	0.02
M2: Scientific Validity of Evolutionary Theory	69.21	15.88	65.39	15.38	0.02
M3: Evolution of Humans	64.86	12.68	67.19	15.03	0.00
M4: Evidence of Evolution	68.63	16.22	65.85	14.72	0.02
M5: Scientific Community's View of Evolution	66.74	15.79	64.46	14.56	0.01
M6: Age of the Earth	69.07	16.09	66.13	15.09	0.17

Objective 2: Demographic Category Analysis

MATE scores, p-values, and Pearson's R correlations were calculated for each demographic category (major/non-major, religious affiliation, gender, age, ethnic heritage, high school classification). Significant result categories ($p \leq 0.05$) are reported in Table 4 for pre- and post-test survey results. An increase in MATE scores was observed between pre-test and post-test for both majors and non-majors, overall but not in ethnic heritage categories, where African American

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post-test scores were lower than their majors' pre-test MATE scores and all Other Ethnic Groups (non-Caucasian and non-African).

Table 4

Mean, Standard Deviation, and P-value of MATE Survey Question Categories by Demographics Groups Between the Pre-test and Post-test Survey (N≥30)

Demographic	Pre-Test			Post-Test		
	Mean	SD	P-value	Mean	SD	P-value
Majors	67.44	15.14	0.00	69.07	16.09	0.09*
Non-Majors	63.83	15.02		66.13	15.09	
Christian	62.76	15.63	0.00	63.57	14.06	0.00
Non-Christian	80.89	12.86		85.25	14.04	
Catholic	69.56	11.82	0.00	68.93	14.93	0.01
Protestant	60.97	13.86		62.91	13.72	
Traditional	64.48	15.03	0.00	66.32	15.14	0.06*
Non-Traditional	71.82	15.24		71.92	16.91	
Male	66.95	16.64	0.00	65.57	0.19	0.19*
Female	63.76	13.71		67.41	14.28	
Public High School	65.70	14.89	0.10*	66.96	14.91	0.37*
Private High School	62.62	18.18		63.45	20.57	
African American	63.84	10.12	0.38*	65.54	10.78	0.65*
Caucasian	64.79	16.08		66.37	15.76	
African American	63.84	10.12	0.03	65.54	10.78	0.09*
Other Ethnicity	67.15	12.27		70.00	14.16	
Caucasian	64.79	16.08	0.08*	66.37	15.76	0.04
Other Ethnicity	67.15	12.27		70.00	14.16	

*No Significant Difference in Results

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All background question groups showed significant differences between biology majors and non-majors for traditional students, of Caucasian heritage, who were female, and were between the ages of 19-20 on the pre-test survey, with biology majors showing higher rates of acceptance (Table 5). Significant differences were found between majors and non-majors of traditional age and who attended a public high school, identified as Baptist, and were of Caucasian heritage for 2 of the 3 question categories (student's religiosity and natural selection taught as different from evolution) on the post-test survey, with biology majors showing higher rates of acceptance.

Table 5

Mean and Standard Deviations of Background Survey Question by Significant P-value Demographic Groups Majors vs Non-majors on the Post-test Survey (N≥30)

Category	Demographic	Majors		Non-Majors		p-value
		Mean	SD	Mean	SD	
B1	Traditional	68.79	16.01	65.72	14.88	0.00*
	Non-Trad.	74.60	18.66	71.48	16.91	0.00*
B2	Public HS	69.04	15.20	66.45	14.81	0.00
	Baptist (All)	59.18	14.05	58.92	13.94	0.01
	Caucasian	69.15	16.92	65.71	15.42	0.02
	<18	67.54	16.75	65.50	13.75	0.00
	19-20	69.06	14.80	64.75	15.20	0.02
	Traditional	68.79	16.01	65.72	14.88	0.00
B3	Public HS	69.04	15.20	66.45	14.81	0.00
	Caucasian	69.15	16.92	65.71	15.42	0.00
	Male	70.02	16.49	64.32	16.61	0.00
	< 18	67.54	16.75	65.50	13.75	0.00
	19-20	69.06	14.80	64.75	15.20	0.01
	Traditional	68.79	16.01	65.72	14.88	0.00

* P-value result is between Non-Majors Traditional students versus Non-Traditional students

Strong Pearson's R correlations (Table 6) were found for each demographic category. Fleiss (1986) suggest that $r < 0.4$ indicates low correlation, $0.4 > r < 0.75$ indicates fair to good correlation, and $r > 0.75$ indicates a very strong correlation. The correlation for Catholic non-majors between pre-test and post-test MATE scores was $r=0.41$, indicating that their views did not change greatly over the semester. Conversely, the correlation for non-traditional non-majors between pre-test and post-test MATE scores was $r=0.93$ indicating that their views did change greatly over the semester.

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Table 6

Pearson's R Correlations Between Pre-test and Post-test Surveys of Demographic Groups with Significant Results on MATE Survey (N≥30)

Demographic	Majors		Non-Majors	
	Pearson's R	Sample Size	Pearson's R	Sample Size
Majors	0.74	118	--	--
Non-majors	--	--	0.79	416
Catholic	--	--	0.41	30
Church of Christ	--	--	0.68	30
Baptist (All)	0.86	40	0.65	146
Southern Baptist	--	--	0.82	32
Non-denom.	--	--	0.72	109
Non-Christian	--	--	0.71	55
Male	0.88	167	0.79	394
Female	0.88	184	0.79	263
< 18 years of age	0.87	56	0.62	137
19-20 years of age	0.87	33	0.73	209
21-22 years of age	--	--	0.87	41
Traditional	0.88	98	0.74	400
Non-Traditional	--	--	0.93	31
African American	--	--	0.59	32
Caucasian American	0.89	84	0.78	357
Public High School	0.87	99	0.73	405

Demographic category analysis results for MATE scores are reported in Table 7.

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Table 7

Mean of MATE Scores from all Surveyed Demographics Groups that Scored Above Surveyed Group Average

Categories	Pre-Test				Post-test			
	Majors	n	Non-Majors	n	Majors	n	Non-Majors	n
Catholic	71.1	43	68.5	60			68.9	35
Presbyterian	70.6	8	67.3	7	-----			
Episcopal	82.0	1	74.2	5	-----		68.5	2
Methodist	70.5	27	67.4	33	74.7	11		
Lutheran	75.0	1			-----			
Baptist-Missionary	83.2	5			84.3	3		
Other Christian					70.1	17		
Agnostic	83.5	26	84.2	42	82.3	7	88.0	25
Atheist	92.2	12	87.0	23	99.6	5	83.8	15
Buddhist			68.0	7	-----			
Bahai	72.0	1	-----		-----		-----	
Jewish	92.0	1	-----		89.0	1	-----	
Pantheist	90.0	2	75.3	3	91.0	2	79.0	1
Other			71.1	20	80.0	3	84.5	10
All Non-Christian	82.3	53	80.1	98	88.1	18	84.3	55
21-22			68.2	67	75.0	6	70.4	41
23-24	75.3	7	71.1	27	76.7	3	68.7	14
25-28	76.8	9	68.8	26	72.3	3	70.9	19
29-32	75.0	2	74.4	11	78.0	2	74.4	7
>33	73.8	4	71.2	13	-----		69.6	5
Nontraditional	75.7	15	70.6	50	74.6	5	71.5	31
Asian American			73.3	10	72.5	4	76.8	5
Hispanic American					70.7	3		
Foreign			68.5	15	93.0	1	73.3	7
Native American							73.0	3
Undecided	75.5	4	67.1	13			69.2	6

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Discussion

Arkansas has been found to rank last in acceptance of evolution (Heddy & Nadelson, 2012). Average MATE scores for UCA and ATU students showed significant differences with UCA students generating higher scores for both pre- and post-test, regardless of their major. This was surprising, given the similarities between these two institutions (proximity -- 47 miles between campuses, enrollment size, etc). These results suggest that students' specific educational and social backgrounds have a significant role in their level of acceptance of evolutionary theory, regardless of major. Rissler (2014) also evaluated evolution acceptance rates for various religious faiths for both biology majors and non-majors. Results of this study indicate that religious affiliations are strong predictors for acceptance of evolutionary theory.

The inclusion of Creationism as a valid alternative to evolutionary principles in high school classrooms influences students' level of acceptance of evolutionary theory as college students (Moore & Cotner, 2009), and we suspect that this is a primary factor in explaining the different rates of acceptance of evolutionary theory between UCA and ATU.

Students' pre-test comments reveal common misconceptions about human ancestry and evolution:

I think things change (evolve) over time, but I don't think we came from monkeys,

I full-heartedly believe God created all things in the form they are in now. God created the first humans and animals,

One species doesn't evolve into another.

Pre-test comments also reveal misconceptions about the validity of science:

How would anyone know if its 4 billion or 20,000? What is the earliest human recording? Does carbon dating really work or explain the truth? If you can trust carbon dating then yes you would think it was 4 billion. It like everything else is man-made,

Biblically, there is no specific date as to when the Earth was actually created,

Science itself admits that it doesn't know everything and never will-why it continually strives to do so I'll never understand. I believe God created the world because it says so in the Bible-which is the word of God. God doesn't need science to prove who He is or what He did and neither do I,

Evolution is a valid theory, but I don't believe it.

Some post-test comments suggest a shift towards acceptance of core scientific principles, but still reflect common misconceptions about human ancestry and evolution:

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I realize that animals have adapted and changed over time but I don't believe that animals we have now came & evolved from a completely different looking animal. Regardless of religious beliefs, there just is no way that we as humans evolved from apes. If we did, why aren't apes still evolving into humans?,

I don't have a problem thinking things change over time, but the Earth is not that old, cavemen were humans, the big bang theory is stupid. Dinosaurs did live at the same time as humans-dragon art all over the world, references to dinosaurs in the Bible,

I do not disagree with evolution solely on my religious beliefs but it does not make sense. I understand that animals have to change some of their characteristics to survive BUT if we, humans, came from what was once a monkey, why are there still monkeys?,

I still believe that God created humans as we are now, along with everything else.

Some post-test comments regarding the validity of science continue to reveal misconceptions:

Evolution is false. In the beginning GOD created the heavens & the earth-Genesis 1:1,

Though I am religious, I do consider parts of the evolutionary theory to be plausible alongside creationism,

Just because evolution seems to be valid, doesn't mean the Biblical creation is incorrect. The bible never explains what creatures look like. Why can't both be true?,

The way scientists "prove" natural selection is by evidence of similar fossils on the shores of S. America and Africa etc...The way they "prove" Pangea is natural selection. Complete and total circular reasoning. They claim that Evolution is only a 'theory' but in order to test this 'theory' they automatically assume that the Earth is billions of years old.

Demographics were examined by Nadelson & Sinatra (2010) and were found to have significant roles in students' acceptance of evolutionary principles. The results of this study are consistent with these findings, and support the hypothesis that acceptance rates of majors and non-majors are significantly different. All first-year students enter college with varying levels of acceptance and understanding of scientific principles. Students who choose to pursue a degree in science may have had sound high school science courses which affected their acceptance of evolution. After exposure to college level instruction in a freshmen biology course, we would like to think that a smaller knowledge gap exists between biology majors and non-majors.

Pre-test data revealed significant differences in rates of acceptance between traditional and non-traditional students, but were not detected in post-test data, regardless of major. This same pattern was observed when data comparing public vs. private high school attendance was evaluated. We suspect that lack of significance in post-test data is due to the quality and detailed level of instruction presented to students during the semester-long course. These results are

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consistent with the findings of Shtulman & Prassede (2008), who found that students' acceptance of evolution was correlated with their understanding of evolution.

Significant differences in rates of acceptance also were detected between male and female students' in pre-test data. Here, societal influences concerning expected gender roles in scientific vs. other fields may be influencing factors. Miller et al., (2015) examined the global perception of gender in scientific roles and found that 66 nations strongly associated science more strongly with men than with women.

Religious instruction that contradicts scientific understanding of the natural world appears to have influenced acceptance rates of evolutionary science, as evidenced by analysis of MATE scores: non-Christian show higher rates of acceptance in both pre- and post-test results than Christians. Equally important is the finding that students who identified themselves as Christian were the only demographic that did not show any significant change in their level of acceptance between pre- and post-test results. Even though Williams (2009) found that acceptance of evolution does not necessarily preclude belief in a god or other religious faiths, our results indicate that the influence of instruction in a Christian belief system results in significantly lower acceptance of, and resistance to, core scientific principles upon reaching college. Rissler et al., (2014) have also recently concluded that religiosity, more so than education, predicts students' initial views on evolution as they enter the college science classroom.

This study adds support to the significant effect of students' religiosity on their acceptance of core biological principles. Most religions begin the indoctrination of children within their faith at the pre-school age. If this instruction is contrary to sound science, or is presented as scientific fact, this deliberate miseducation of students, in turn, leads to confusion in the classroom. Potentially, such students will enter college with 10 or more years of misinformation about not only scientific principles but the process of science as a way of understanding the natural world. Most state science standards do not require instruction in evolution until high school. Moreover, even though 40 states have indicated interest in adopting the Next Generation Science Standards (2013), only 18 states as of December 2016 have done so. These standards add more biological concepts such as diversity and adaptation to middle school and junior high curricula. Currently, curricula for this age group consist primarily of earth science and engineering technology based instruction. For Arkansas, the current plan has adopted the NGSS for middle-school grades in 2017 and will be implementing them for high schools in 2018.

Different teaching approaches are emerging at the college level to help facilitate student understanding and acceptance of scientific principles. At ATU there has been a movement towards the "flipped classroom" design for freshmen level courses. The idea behind this design is to facilitate more time for classroom discussion of the course content between instructors and students. Students are expected to complete homework assignments and chapter reading outside of the classroom and devote their class time in actively engaging with the instructor. For the freshmen level science courses, this gives instructors the opportunity to review the process of science and discuss current science research as it relates to the course topics. The intention of this design for the science classroom is to make these students more scientific literate and to aide in their understanding as voting citizens exactly why science is important and impactful in their lives.

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Science outreach from university faculty into community religious organizations is greatly needed. Future studies examining political influences also are needed, as this is a source of influence that is also embedded with various religious views. A standard seminar series about the NOS and the theory of evolution to present to teachers of all subject areas and at every level of education for continuing education purposes would also be useful.

Limitations

Potential limitations of this study include response rates, and small sample sizes of various demographic groups. In addition, data collected from human participants may not reflect honest or unbiased responses due to peer pressure and expectations of perceived instructor. To prevent priming and foreknowledge of questions, students were administered the pre-test during the first week of the semester and the questions were presented in neutral wording as much as possible to avoid bias from students' responses.

This research is also limited to two of the three largest universities in Arkansas and may not represent the viewpoints of students in other states or smaller universities within Arkansas. Finally, it was not possible to control for students who had enrolled in these courses previously but then either dropped the course or received a failing grade. Some students may also have had previous exposure to evolutionary principles in other courses such as psychology, before taking either the majors or non-majors introduction to biology course.

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Appendix A

A. Demographics

SA=STRONGLY AGREE, A=AGREE, U=UNDECIDED, D=DISAGREE, SD=STRONGLY DISAGREE	SA	A	U	D	SD
1. I consider myself to be a religious person					
2. I consider myself to be "open-minded"					
3. I attend church regularly					
4. I am indifferent towards religious issues					
5. Accepting (or "believing in") evolution would threaten my religious beliefs.					
6. I am antagonistic towards (opposed to) religion					
7. I believe that there are serious conflicts between science and religion					
8. My parents would describe themselves as religious					
9. Discussing evolution makes me uncomfortable					
10. My high-school science teacher(s) presented creationism/creation science/intelligent design as a legitimate alternative to evolution.					
11. My high-school science teacher(s) presented the processes of natural selection instead of evolution.					
12. My high-school science teacher(s) did not cover evolution or any alternatives in the classroom.					
13. The processes of natural selection are different from evolutionary theory.					
14. "Survival of the Fittest" refers to natural selection are fundamental to evolutionary theory.					
15. The processes of natural selection are the same as evolutionary theory.					
16. Natural selection is an active process seen in organisms today.					

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B. Background (To maintain confidentiality, please **DO NOT** write your name on this page). For the following items, please indicate your agreement/disagreement with the given statements using the following scale (**please respond to all items**):

SA=STRONGLY AGREE, A=AGREE, U=UNDECIDED, D=DISAGREE, SD=STRONGLY DISAGREE	SA	A	U	D	SD
1. Organisms existing today are the result of evolutionary processes that have occurred over millions of years.					
2. The theory of evolution is incapable of being scientifically tested.					
3. Modern humans are the product of evolutionary processes that have occurred over millions of years.					
4. The theory of evolution is based on speculation and not valid scientific observation and testing.					
5. Most scientists accept evolutionary theory to be a scientifically valid theory.					
6. The available data are ambiguous (unclear) as to whether evolution actually occurs.					
7. The age of the Earth is less than 20,000 years.					
8. There is a significant body of data that supports evolutionary theory.					
9. Organisms exist today in essentially the same form in which they always have.					
10. Evolution is not a scientifically valid theory.					
11. The age of the Earth is at least 4 billion years.					
12. Current evolutionary theory is the result of sound scientific research and methodology.					
13. Evolutionary theory generates testable predictions with respect to the characteristics of life.					
14. The theory of evolution cannot be correct since it disagrees with the Biblical account of creation.					

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15. Humans exist today in essentially the same form in which they always have.					
16. Evolutionary theory is supported by factual historical and laboratory data.					
17. Much of the scientific community doubts if evolution occurs.					
18. The theory of evolution brings meaning to the diverse characteristics and behaviors observed in living form.					
19. With few exceptions, organisms on Earth came into existence at about the same time.					
20. Evolution is a scientifically valid theory.					

Additional comments (continue on back if necessary):

