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EFFECTS OF A YEC APOLOGETICS CLASS ON STUDENT WORLDVIEW[1]

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ABSTRACT

Creationism is a significant component of an overall Christian worldview. A Creation Worldview Test (CWT) was administered to students both before and after completion of a required Apologetics course dealing with the creation/evolution controversy. Pre-test analysis revealed that incoming students tend to have a creationist worldview, however their CWT scores reflected a degree of uncertainty or neutrality on scientific creation and the age of the earth. Post-test analysis showed a significant shift toward a young earth creationist (YEC) view. Implications for teaching apologetics and development of a Creationist worldview based on a Six-day Young Earth perspective were explored and identified.

INTRODUCTION

Students' worldview development is a major concern for Christian education. At Biblically conservative colleges committed to an historical interpretation of Genesis, the development of an informed six-day YEC perspective is an important educational goal. This paper presents the results of one study in a series undertaken to identify the components of a Christian creationist worldview and develop a reliable instrument for the measurement of YEC beliefs.

The measurement of attitudes and beliefs related to the construct worldview is an on-going project at the Institute for Creation Research (ICR), Liberty University, the Nehemiah Institute and Vision International University. This work has been focused on refinement of two instruments, the Creationist Worldview Test (CWT) and the PEERS test. These instruments were designed for the purpose of measuring and defining the construct worldview from a Biblical and Christian context. This research focuses on an attempt to show that a Six-day Young Earth Creationist Worldview may be profiled along three worldview orientations. These are: a) theological, b) science and c) age (related to age of the universe and earth) scales.

HYPOTHESES

The following four hypotheses serve to guide the research. The independent variable for this study is the content and teaching done in an apologetics class at Liberty University. The dependent variables derived from the CWT are: 1) *total scale* (overall indicator of a Six- day Young Earth Creationist or evolutionist worldview); 2) *science scale* (indicator of beliefs related to science concepts concerned with Creation/Evolution); 3) *theological scale* (indicators of beliefs related to basic Biblical Doctrine); and 4) *Age Scale* (indicator of basic beliefs related to the age of the universe and the earth). Using a t-test we hope to determine the extent to which attitudes and beliefs toward creation/evolution depend on the students' experience in the Apologetics class. In other words, do the students' attitudes and beliefs move toward a more positive view of Six-day Young Earth Creationism after exposure to the teaching and content of the Apologetics class?

Hypothesis One:
CWT *total* scale scores will exhibit a significant pre-test to post-test shift favoring the YEC position.

Hypothesis Two:
CWT *science* scale scores will exhibit a significant pre-test to post-test shift favoring the YEC position.

Hypothesis Three:
CWT *theological* scale scores will exhibit a significant pre-test to post-test shift favoring the YEC position.

Hypothesis Four:
CWT *age* scale scores will exhibit a significant pre-test to post-test shift favoring the YEC position.

PREVIOUS RESEARCH ON COLLEGE STUDENTS' BELIEFS ABOUT CREATION

Regarding Creation Surveys of College Students beliefs about Creationism, Bergman (1999) wrote:
> One longitudinal study indicates that acceptance of creation may be growing among some college students. A survey of Mormon students at Brigham Young University (BYU) found that in 1935 36% (N=1159) of the students agreed with the statement '*Man's creation did not involve biological evolution*,' compared with 81% (N=1056) in 1973. In 1935 5% compared with 27% in 1973 agreed with the statement, 'The world's creation did not take millions of years.'

In another study, Spencer (1988) found that 34% of a sample of Wichita State University students (N=149) labeled themselves as creationists, 61% theistic evolutions, and 3% as atheistic evolutionists. Continuing, Spencer noted that 47% believed the Genesis account of Noah and the flood, while 72% believed the Biblical account of Adam. It is noteworthy, and indicative of the need for apologetics education, that a substantially greater proportion of the student sample believed in a literal Adam than in the Genesis account of Noah's flood.

Fuerst (1984) in a study of Ohio State University students (N=2,387) found an 80% acceptance rate of the theory of evolution. Feder (as cited in Brazelton, Frandsen, McKnown, & Brown, 1999) found that 62.3% of a Connecticut college student sample believed that "God created the universe". Lawson and Weser, (also cited in Brazelton, et al, 1999) found that 34% of an Arizona State University sample believed that "All things were created during a short period of time by an act of God" (p.623). Several of the questions in the Brazelton study were similar to CWT items. In the following examples the percentage supporting each statement are shown in parentheses.
> With which of the following statements do you most agree?
> 1. "Life likely began as related in the Book of Genesis in the Bible" (63.8%)
> 2. "Life was likely started by some intelligent creator though not necessarily as related in the Bible" (16.4%)
> 3. "Life likely originated in some manner from the nonliving materials of our planet" (16.7%)
> 4. "Life likely arrived somehow from elsewhere in the universe" (2.5%)

These results are from 111 undergraduate students at a large, secular Southwestern University. Although, there is not an exact correspondence in the questions asked, it is interesting to note that in the approximately 15 years from the Fuerst study to the Brazelton study, the beliefs of students on presumably representative secular university campuses shifted dramatically in what appears to be the direction of the creationist view.

Instrumentation and Development of the CWT

The CWT has been used in a number of studies (Overman, 1997, Overman & Deckard, 1997, Deckard, 1997 & 1998 and Ray 2001). To date only the Ray study focused on aspects of the four component scales. These are: 1) *total scale* (indicator of a creationist or evolutionist worldview); 2) *Science scale* (indicator of beliefs related to science concepts concerned with Creation/Evolution); 3) *theological scale* (indicators of beliefs related to basic Biblical Doctrine); and 4) *Age Scale* (indicator of basic beliefs related to the age of the universe and the earth). The CWT has been shown to be both valid and reliable (Deckard & Sobko, 1998, Ray, 2001). The instrument is a Likert scale on which subjects are asked whether they strongly agree, (SA); tend to agree, (TA); strongly disagree, (SD); tend to disagree, (TD); or are neutral (N); toward statements about a number of items related to creation/evolution, science, theology, and age of the earth. The instrument is purported to measure worldview from two realms, creation or evolution. The CWT has been shown to correlate .79 with the PEERS test, which measures a Christian worldview (Ray, 2001).

This instrument was specifically designed for the purpose of measuring the construct worldview within the context of the creation/evolution controversy. Currently the instrument has proven to be useful for

studying junior high, high school, and college students, and science teachers' attitudes and beliefs (Deckard, 1997; Deckard & Sobko, 1998; Overman, 1997; Ray, 2001; and Smithwick, 2000). This paper has a more specific focus of attempting to refine the current construct known as a creationist worldview and to clarify the construct known as Six-Day Young Earth Creationist Worldview.

In contrast to the CWT, Rutledge & Warden (1999) developed an instrument for the measuring the acceptance of the theory of evolution. Their instrument development followed a similar pattern to the CWT development. For example, the MATE (Measure of Acceptance of the Theory of Evolution) consists of a Likert scale. It was validated and found to be reliable in a manner similar to the approach used for the CWT. One major difference between the two would the direction of the scoring. For the MATE the items that are answered in the positive are considered to be evolutionary in view, whereas the items that are answered in the positive in the CWT are considered to be creationist in view. The MATE is a 20 item scale which upon examination can be observed to contain two subscales similar to those found in the CWT. These are a science sub scale and an age sub scale. The one sub scale that is missing in the MATE is a theological one. This is related to the fact that the evolutionary worldview is a naturalistic subjective view lacking an objective theological component.

METHOD

The Apologetics Course

Undergraduate students of Liberty University are required to take Apologetics 290, History of Life. Faculty from the Center for Creation Studies teach the course from a young earth creation perspective. The purpose as stated in the University catalog is to strengthen the faith of students in the Biblical account of creation and equip them to defend their faith. The goals of this study were two-fold: 1) to measure the worldview of students as they enter and exit the course; and 2) to assess any change in their worldview over the course of the semester. To accomplish these goals, in the Fall semester, 2001 the CWT (Creationist Worldview Test) was administered at the beginning of the course (pre-test) and at the end of the course (post-test).

The course met for 50 minutes once a week for a total of 12 lectures and 3 exams. Course content consisted of predominately scientific evidence and arguments with 2 lectures emphasizing the Scriptures. The required textbook was *Scientific Creationism* by Henry Morris. Consistent with the doctrinal statement of Liberty University, the course was taught from a young earth creation perspective. Instructors follow a "two model approach" presenting the arguments commonly used to support evolutionary theory and the creationist model. Difficulties and problems with evolution are discussed along with the advantages of the creation worldview. A majority of the scientific items on the CWT were discussed in the course or the textbook. The topics covered in the course included:

1. Limitations of Science
2. Genetic Limits of Evolution
3. The Fossil Record
4. Human Evolution
5. Origin of Matter and Energy
6. Age of the Earth
7. Origin and Complexity of Life
8. Science and Scripture

Students enrolled in Apologetics 290 were pre-tested on the first day of class before any content was covered. The students (N = 131) were given a Post-test (N=125) at the end of the class. Students answered anonymously except each test was coded to enable correlation with the post-test after the final exam on the last day of the course. Only those students for whom both pre- and post-tests were available were used in the analysis (N = 125). The standardized procedures for test administration as stated in the CWT manual were followed.

Statistical Methodology

1. Data were analyzed using the SPSS statistical software.
2. For purposes of statistical analysis the Likert scale items were recoded to reflect a Six- Day Young Earth Creationist response as a "1" or strongly agree.
3. As an aid to reader comprehension, the item responses were recoded after analysis to a scale
4. of 1-100. The higher values indicate a Six-Day Young Earth Creationist Worldview, middle values as Neutral, and lower values as an Evolutionary Worldview. The recoding was as follows: 1=100, 2 =75, 3=50, 4=25, 5=1

5. CWT scores for each student for both the pre- and post-tests were calculated as a mean, excluding students with missing values.
6. CWT scores for each student on each of the three subscales were calculated as above.
7. Pre- and post- sample mean scores were calculated for the Total CWT and its three sub-scales (Table 1).
8. Paired sample t-tests were conducted to test each hypothesis (Table 2).
9. Each item mean was calculated on the pre and post-tests, and the mean differences were tabulated (Table 3).

RESULTS

Characteristics of the Sample

Students entering the apologetics course tend toward a creation worldview. In particular, the theological component is strong as reflected by the pre-test means on the CWT (Table 1). The high Theological score is not surprising for this group of students since Liberty University has a reputation as a conservative school, which takes a literal and specific Six-day Young Earth Creationist view of Scripture. For this reason, we would expect that the students who would choose to attend the school would be strong theologically. In addition, many of the students starting the apologetics course may have already had courses in theology, Bible, evangelism, and Christian ethics.

In spite of strong theological base, relatively low CWT scores were found on both the understanding of science scale and the age scale as they relate to the Six-day Young Earth Creationist Worldview (Table 1). Even though the students entering the course might consider themselves to be "creationists", the low scores on two creation-science subscales indicate the need for the type of apologetic course which is the focus of this study. Even students with an apparently strong doctrinal stance will need instruction in creation-science apologetics if they are to meet the challenge of the contemporary secular world. Indeed the whole purpose of the CWT is to measure this need and the effectiveness of educational attempts to address it.

Testing the Research Hypotheses

Paired samples t-tests were run using SPSS to test the four research hypotheses (see Table 2). The results of this test for each of hypotheses are as follows:

Hypothesis One
CWT *total* scale scores will exhibit a significant pre-test to post-test shift favoring the YEC position.

The CWT total scale mean for the pre-test was 78.89 and on the Post-test the mean was 83.78. The t-test showed that this increase was significant at the .05 level with a 2-tailed significance value of .001. The null hypothesis is rejected, as there is a significant difference in the pre and post-test means of the CWT scores.

Hypothesis Two
CWT *science* scale scores will exhibit a significant pre-test to post-test shift favoring the YEC position.

The mean for the science scale pre-test was 74.78 and on the post-test the mean was 79.43. The t-test showed that this increase was significant at the .05 level with a 2-tailed significance value of .006. The null hypothesis is rejected, as there is a significant difference in the pre and post-test means of the science scale.

Hypothesis Three
CWT *theological* scale scores will exhibit a significant pre-test to post-test shift favoring the YEC position.

The mean on the pre-test for the theology scale was 90.54 and on the post-test was 91.73. The t-test showed that this increase was not significant at the .05 level with a 2-tailed significance value of .353. The null hypothesis is retained, as there is not a significant difference in the pre and post-test means of the theology scores

Hypothesis Four
CWT *age* scale scores will exhibit a significant pre-test to post-test shift favoring the YEC position.

The mean on the pre-test for the age scale was 67.88 and on the post-test was 79.33. The t-test showed this increase to be significant at the .05 level with a 2-tailed significance value of .000. The null hypothesis is rejected, as there is a significant difference in the pre and post-test means of the age scale.

Table 1
Paired Samples: Pre – Post-Test Mean Differences

CWT Scale		Mean	N	Std. Deviation	Std. Error Mean
Total Sub-scale	Pre-test	78.8944	125	9.8967	.8852
	Post-test	83.7847	125	12.5608	1.1235
Theology Sub-scale	Pre-test	90.5362	125	8.6442	.7732
	Post-test	91.7327	125	10.3049	.9217
Science Sub-scale	Pre-test	74.7755	125	11.2094	1.0026
	Post-test	79.4294	125	14.6659	1.3118
Age Sub-scale	Pre-test	67.8830	125	15.5795	1.3935
	Post-test	79.3340	125	17.4661	1.5622

Table 2
Paired Samples Test – Confidence Intervals for Pre – Post test differences

		Paired Differences			t	df	Sig. (2-tailed)
		95% Confidence Interval of the Difference					
		Lower	Upper				
Total Scale	Pre-test – Post-test	-7.8643	-1.9162		-3.255	124	.001
Theology Sub-scale	Pre-test – Post-test	-3.7382	1.3452		-.932	124	.353
Science Sub-scale	Pre-test – Post-test	-7.9470	-1.3607		-2.797	124	.006
Age Sub-scale	Pre-test – Post-test	-15.8281	-7.0739		-5.178	124	.000

Table 3: Item Analysis of Pre-test/Post-test Means

Item Means Pre- and Post-test: Answers have been recoded so that higher values reflect 6-Day Young Earth Creationism with a high value of 100 and low value of 1.

	Sub-Scale	Mean-Pre-test	Mean-Post-test	Post-Pre Difference
1 Space, time and matter have always existed	Age	63.51	75.74	12.23
2 An eternal Creator supernaturally made the physical universe.	Theology	96.33	98.21	1.88
3 Biological life developed by a series of natural processes.	Science	81.22	83.87	2.65
4 Biological life came from non-living matter by chance.	Science	96.71	90.44	-6.27
5 Each of the major kinds of plants and animals were made functionally complete.	Theology	87.02	94.22	7.20
6 Genetic mutations have caused beneficial changes in living things.	Science	55.24	59.90	4.66
7 The first humans were specially created different from all other life on earth.	Theology	89.55	88.28	-1.27
8 The rocks and fossils show that the earth is millions of years old.	Age	73.18	82.09	8.91
9 Great quantities of sedimentary rock layers and fossils were deposited by a worldwide flood.	Science	84.43	93.97	9.54
10 The Creator continuously maintains all laws of nature.	Theology	87.50	90.42	2.92
11 The original creation did not include disease, aging, and extinctions.	Theology	87.99	94.62	6.63
12 The competent Creator made the universe for an ultimate purpose.	Theology	95.99	98.60	2.60
13 It is appropriate in scientific studies to consider creation.	Science	92.38	94.83	2.45
14 Evolution can be proven as a scientific fact.	Science	89.73	87.24	-2.49
15 Examples of special design in nature can be explored scientifically.	Science	77.87	79.44	1.74
16 A triune God -- Father, Son, and Holy Spirit -- all participated in the work of creation.	Theology	81.15	85.22	4.07
17 There is only one eternal God who is the source of all being and meaning.	Theology	98.85	97.00	-1.85
18 Nature reveals itself as the creator.	Theology	82.44	75.94	-6.50
19 The Bible is scientifically correct.	Science	88.49	89.06	.57
20 All things in the universe were made by God in six twenty-four hour days.	Age	77.68	96.04	18.36

21 Man's sin brought God's curse of death and separation to all of His creation.	Theology	93.99	97.02	3.03
22 Genesis chapters one through eleven lack historical truth.	Theology	89.17	90.94	1.77
23 Man's separation from God can only be remedied by Jesus Christ's death and bodily resurrection.	Theology	95.77	95.41	-.36
24 Fellowship with the Creator requires belief and personal trust in Jesus Christ.	Theology	97.89	96.38	-1.51
25 There is not a real place of permanent suffering which is known as hell.	Theology	92.35	90.23	-2.12
26 Those who refuse to put their trust in Jesus Christ will spend eternity in hell.	Theology	92.35	93.64	1.29
27 Not all Christians have to share the gospel of Christ.	Theology	93.47	87.02	-6.45
28 Christians participate in subduing the earth for God's glory.	Theology	80.31	88.62	8.31
29 Dinosaurs and man lived at the same time.	Age	71.00	85.05	14.05
30 God created land dinosaurs on the sixth day of creation.	Age	49.55	73.52	23.97
31 Dinosaur fossil graveyards are evidence of catastrophic burial.	Science	65.57	81.44	15.87
32 The rock layers in the Grand Canyon show evidence of being rapidly laid down.	Age	66.03	81.22	15.19
33 Fossils in the Grand Canyon layers reveal the exact geologic column proposed by most scientists.	Science	53.58	57.90	4.32
34 Formation of sedimentary layers and canyons caused by the eruption of Mt. St. Helens supports a creationist model.	Age	62.91	74.02	11.11
35 Entropy (increasing disorder) and evolution are compatible.	Science	64	61.85	-1.96
36 The Creation model and the Second Law of Thermodynamics are compatible.	Science	58.05	75.23	17.18
37 It is important to recognize Jesus Christ as the Creator.	Theology	91.10	89.85	-1.25
38 Man has taken millions of years to get to his present form.	Age	91.80	90.35	-1.45
39 The universe has gone through many changes since it exploded into existence billions of years ago.	Age	88.71	88.13	-.58
40 Life evolved slowly from a "primordial soup."	Science	91.16	91.54	.38
41 Life evolved from a simple cell to more complex organisms.	Science	90.37	89.15	-1.22
42 There is no evidence that life is continuing to evolve today.	Science	54.12	71.27	17.15

43 The fossil record provides examples of transitional forms.	Science	63.43	76.48	13.05
44 Fossils should be dated according to the rocks in which they are found.	Age	54.62	62.57	7.95
45 Rocks should be dated according to the fossils found in them.	Age	54.03	64.65	10.62
46 Geologic evidence indicates there was once a worldwide flood.	Science	89.37	96.19	6.82
47 In modern geology the present is the key to the past is an established fact.	Science	40.91	43.56	2.65
48 Micro-evolution (small changes within a particular species) is evidence that macro-evolution (changes from "kind to kind") has happened.	Science	75.82	79.15	3.63
49 Plant life can experience emotions like anger and joy as humans do.	Science	84.65	86.63	1.71
50 Animals have the same reasoning ability as humans, but on a lower level.	Science	71.28	72.68	1.04
51 In time, humans will likely develop into a higher life form than what is known of now.	Science	85.40	92.27	6.87
Valid N (listwise)	109			

Specific CWT items

The results of the individual items (Chart 1) are of interest simply on the basis of their content. All but 13 of the items show a positive shift toward the creation viewpoint. Most of the reversals are small in magnitude and occur on the Theology sub-scale. Pre-test scores on the Theology sub-scale are already very high (in agreement with the course content) and no doubt reflect a ceiling effect. The encouraging results are the large increases for items 1, 20, 30, 31, 32, 36, 42 and 43, which deal very specifically with issues that are central to the six-day creation position.

CONCLUSION

The data presented here highlight the benefits of an apologetics course on reinforcing a Biblical-Creation worldview. It further demonstrates that college students can change their worldview in response to teaching from a six-day, young-earth creation perspective. This should encourage other Christian college educational leaders who are serious about training the next generation of Christian leaders to consider six-day young earth creationism as part of their apologetics curriculum. In addition, it shows that six-day young earth creation is a strong and viable alternative to the many creation compromise positions.

Another important aspect of the study is the importance of pre-testing for courses that have a goal of worldview change. Without knowledge about the worldviews of incoming students, it is difficult to design a course to change their worldview. Additionally, without follow-up measures it is difficult to assess the effectiveness of the apologetics course. One important area for future research is to conduct a longitudinal study to measure the long-term impact of creation-science apologetics courses. This is especially true since in the course of the study the authors became aware of individual students who were resistant to change on the scientific positions advocated in the course. A longitudinal study might answer the question of whether this resistance reflects short-term reactance on the one hand, or a reflectively articulated skepticism toward creation-science arguments and favorable view of Darwinism on the other.

During the study, it became apparent that some CWT items may be confusing or ambiguous for students. Future research aimed at refining the CWT instrument is indicated. The most effective way to develop the CWT may well be to do so in conjunction with the development of an effective apologetics course. The two would be seen as working hand-in-hand. Future research aimed at examining and enhancing the fit between the CWT and actual creation-science apologetics curriculum is important.

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