*In A. A. Snelling (Ed.) (2008). Proceedings of the Sixth International Conference on Creationism (pp. 461–471). Pittsburgh, PA: Creation Science Fellowship and Dallas, TX: Institute for Creation Research.*

# Georgia Public School Board Members' Beliefs Concerning the Inclusion of Creationism in the Science Curriculum

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## Abstract

This study investigated the beliefs of Georgia Public School board members regarding young earth creationism (YEC) and old earth creationism (OEC) and the association of these beliefs with the inclusion or exclusion of creationism in the district science curriculum of Georgia public schools. A random sampling (144) of 1,034 local school board members were invited to participate in the survey.

Data analysis indicated that school board members' beliefs regarding school board members in YEC had a positive correlation while beliefs in OEC had a negative correlation with the permitted inclusion of creationism in the district science curriculum. However, no correlation was found between school board member beliefs in YEC/OEC and the required inclusion of creationism.

The results of this study provide insight into connections between beliefs of board members and the science/creationism issue which may translate into enlightened voting decisions.

## Keywords

Beliefs, Creationism, Young earth creationism, Old earth creationism, Evolution, School board members, Administrators

## Introduction

Correlational aspects of the attitudes and beliefs of local school board members and their actions connected to the inclusion of creationism in the district science curricula of Georgia public schools were investigated. The school board answers to the voting public; because the inclusion of creationism in science curricula is very controversial and emotionally charged.

Several public opinion polls were reported in the Polling Report web site. In a *New York Times* poll (November, 2004), the following question was asked: "Would you generally favor or oppose teaching creation along with evolution in public schools?" The results were: 65% favored; 29% opposed; and, 6% unsure. In the same poll, another question was asked: "Would you generally favor or oppose teaching creationism instead of evolution in public schools?" The results of were: 37% in favored; 51% opposed; and 12% unsure. These results differed slightly from a July, 2006 Pew study by Schulman, Ronca, and Bucuvalas of 996 adults nationwide. In this study, 58% said they favored creationism being taught along with evolution, 35% opposed this, and 7% were unsure (Science and Nature, 2006).

According to the results of a 1999 Gallup Poll using a random sampling of 1,000 adults, on the question of teaching creationism along with evolution in public schools, 68% favored, 29% opposed, and 3% no opinion. These poll results indicate a strong public interest in the inclusion of creationism in the science curriculum. These polls indirectly address the specific issues researched in this study.

### *Problem statement*

The aim of this study was to identify possible relationships between beliefs of Georgia public school board members in young earth creationism or old earth creationism and the district's *permitted* or *required* inclusion of creationism in science classrooms.

## Research Questions and Hypotheses

### *Research question 1*

What is the relationship between school board members' personally held beliefs in YEC and OEC regarding creationism and the inclusion of creationism in the school district science curriculum?

The following null hypotheses were created based on the first research question:

$H_0$1: There is no significant relationship between school board members' personally held beliefs regarding young earth creationism and the *permitted* inclusion of creationism in the school district science curriculum.

$H_0$2: There is no significant relationship between school board members' personally held beliefs regarding old earth creationism and the *permitted* inclusion of creationism in the school district science curriculum.

$H_0$3: There is no significant relationship between school board members' personally held beliefs regarding young earth creationism and the *required* inclusion of creationism in the school district science curriculum.

$H_0$4: There is no significant relationship between school board members' personally held beliefs regarding old earth creationism and the *required* inclusion of creationism in the school district science curriculum.

## Review of the Literature

This review examines the role of school board members throughout the United States and their district decisions relating to the inclusion or exclusion of creationism from the science curriculum.

### Board members initiate efforts to include or exclude creationism

We draw from two examples in Georgia. Cobb County, Georgia has been in the national spotlight as a result of the creationism/evolution issue. After receiving a petition in 1996 (with over 2,300 signatures from citizens) supporting the removal of a chapter in a fourth-grade text on evolution, the board approved a disclaimer sticker for biology textbooks. The ACLU argued that the sticker was unconstitutional and a "fundamentalist Christian expression." ("Georgia school board", 2002, p. 1) At a September, 2002 board meeting, Rule IBD: Theories of Evolution were approved. According to the board, a "discussion of disputed views of academic subjects" including creationism were permitted to encourage critical thinking, tolerance, and religious neutrality (Rule IDBD, 2002, p. 1). In January of 2005, a federal judge ordered the disclaimer stickers removed from Cobb County science texts because they could be interpreted as supporting a particular religious belief (Associated Press, 2005; "Judge nixes textbook stickers," 2005; Marus, 2005; Matzke, 2006; "Selman v Cobb," 2005). The evolution-sticker issue affected the school board elections in the summer of 2006. Kathie Johnstone, one-term incumbent and former board chairman, lost her bid for reelection to John Crook, a Baptist minister, in the Republican primary (Stepp, 2006). In addition, the Hall County School Board in Gainesville, Georgia adopted a policy in 1996 which called for teachers to include creationism along with evolution in science class. (Applebome, 1996).

In the vast majority of the cases reviewed, board members took the lead in curricular decision-making concerning the creationism/evolution issue. Local school boards frequently view the management of routine county business as their primary responsibility. School boards tend to be conservative in worldviews as well as beliefs and attitudes. While conservatives are more likely to support a place for creationism in the curriculum, the school boards are also somewhat sensitive to political pressure because they are answerable to the voting public. Therefore, the role of school board members regarding the inclusion of creationism in the science curriculum warrants further investigation. Additionally, twenty-three cases were reviewed in which the school board initiated the move to include or exclude creationism or Christian principles in the curriculum. The review suggests that school board members may be likely to initiate decisions on the inclusion of creationism in the districts' science curricula (Applebome, 1996; Bennett, 1999; "Creationism" 2004; Heuvel, 2004; Lawrence, 2005; McCoy, 2005; Parlow, 2005; Price, 2004; Renick, 2004; Schneder, 2003; "School board," 1996; Scott, 1997; Sidoti, 2002; "Time for new blood," 2006; "Town's schools," 2002; "WV," 2000; Williams, 2004; Wyatt, 2000).

### Factors affecting curricular decisions concerning the creationism/evolution issue

When school board members set curriculum for Georgia public schools, they must adhere to state objectives. These objectives set minimum skill levels. Districts may include additional objectives or skills in the curriculum in addition to the state standards ("Science standards," n.d.). These additional objectives must not violate any state or federal regulation or court order (Deckman, 1999, 2002).

Since the 1987 Supreme Court ruling that banned creationism in public school science instruction, critics of evolution have asserted that scientific controversies concerning evolution should be included in the curriculum (Holden, 2002; Toland, 2005). Lawsuits (or threats of lawsuits) by the opposition have resulted in the removal of creationism from many district science curriculums (Associated Press, 2005; "Judge nixes textbook stickers," 2005; "Kitzmiller v Dover," 2006; Lawrence, 2005; Marus, 2005; Matzke, 2006; Renick, 2004; Selman, 2005; "Teaching Darwin," 2004; Toland, 2005; "Town's schools," 2002).

While state, federal, and district curricular mandates and court decisions are important considerations, politics (local, state, and national) and beliefs concerning creationism are important considerations when discussing the role board members relating to the inclusion of creationism in the district science curriculum. Districts can include supplemental materials and objectives to the state standards. Therefore, creationism may be included

as long as this inclusion does not violate any other regulation or court ruling (Hutton, 2003; "Kitzmiller v Dover," 2006; "Selman v Cobb," 2005; Science standards, n.d.; Tenneson, 2001).

Politics and the creationism/evolution issue have resulted in dramatic turnover in school board memberships as the voting public alternately elects or replaces school boards that support or oppose the inclusion of creationism (Toland, 2005; Stepp, 2006; Williams, 2004).

### Georgia curriculum science standards

In the biology section of the Georgia standards, creationism is omitted.

Addressing the origins of life, the Georgia standards mention building "a knowledge base of biodiversity" (Science standards, n.d., p. 4) in grades K–8. In grades 9–12, the Georgia standards state that present-day species developed from earlier ones as clearly separate species and that natural selection has provided species with heritable characteristics. The standards also state that life on earth is thought to have started from one-celled organisms 4 billion years ago (Science standards, n.d.).

While the Georgia science standards are in direct conflict with creationism, this does not mean that no district in Georgia permits or requires the inclusion of creationism in the curriculum. Because curriculum includes all of a child's experiences at school (Marsh & Willis, 2003), other experiences planned by a school or district may include creationism. For this reason, the attitudes of school board and superintendents members toward the inclusion of creationism in the curriculum are important.

Deckman (1999, 2002) in a study of school board candidates survey found that conservative Christians are more likely than mainstream Protestants to take actions supporting creationism or become a school board candidate.

### Summary

School boards tend to make most decisions regarding the inclusion or exclusion of creationism in the district science curriculum. In Georgia, locally elected school boards select the district superintendent which may affect the superintendent's power to include a highly controversial topic like creationism. Yet, superintendents generally take the lead in curriculum decisions. Including creationism in district science curricula often results in lawsuits against the district. When making such decisions, the school boards and superintendents must take into consideration public attitudes toward creationism, court decisions, state and federal law, and state school board guidelines/regulations. Georgia state standards include evolution but make no mention of creationism. Because school districts can expand the district curricula beyond the minimum Standards, some Georgia districts may decide to add creationism to the science curriculum.

## Methodology

### Subjects

One thousand thirty-four Georgia local school board members were identified and a randomized sample of 144 was surveyed (see Table 1). The entire population of the 1,034 board members was located either from district websites or by phoning districts directly for the information. Board members were selected at random from this list. Of the 144 board members surveyed, 66 responded which is 45.83% of the board members surveyed.

### Instrument

A survey was created (Appendix A) to measure the beliefs regarding the inclusion or exclusion of creationism. The survey was field tested for reliability, readability, and consistency. The field test was conducted October 10, 2006 of five testers. Because some board members have an education background while others do not, individuals were selected from both backgrounds. The varied background and specific expertise of testers were helpful in identifying needed corrections. Field testers reviewed survey format, item clarity and definitions, and wording issues. Appropriate modifications were made based on the field test results.

### Data analysis

The data collected from these surveys were analyzed using the Chi Square Test of Independence by means of the statistical package SPSS 11.0 for Windows. An alpha level of .05 was used in the Chi Square Test of Independence. This test was conducted for the purpose of examining the degree of relationship between subjects' beliefs and the inclusion of creationism in the school science curricula. Tables include expected values in parentheses. The expected values were calculated by SPSS and reflect the values in each cell which could be expected to be determined by chance.

## Findings

The population of 1,034 board members was located either from district websites or by phoning districts directly for the information. Of the total population, 144 board members were surveyed. Sixty-six of these 144 responded to the survey which is 45.83% of the board members surveyed. However, not all respondents answered the questions concerning young earth creationism or old earth creationism or the mandatory or permitted inclusion of creationism in the science curriculum. For this reason statistics

in this study will only include the results of the board members who responded. Therefore, the number of respondents varied in each hypotheses.

### Hypothesis One

There is no significant relationship between school board members' personally held beliefs regarding young earth creationism and the permitted inclusion of creationism in the school district science curriculum.

Thirty-six of the respondents reported that their districts permit the inclusion of creationism (see Table 1). Thirteen of the 36 reported a belief in young earth creationism. The Chi-Square (4.835) and Phi (.291) have significance values of (.028) which are significant ($p<.05$). Therefore the null is rejected.

**Table 1.** Elective inclusion of creationism in the school district science curriculum and school board members' beliefs in young earth creationism.

| | | Belief in young earth creationism | | |
|---|---|---|---|---|
| | | Yes | No | Total |
| Permit the inclusion of creationism in science curriculum | Yes | 13 (9.5) | 23 (26.5) | 36 |
| | No | 2 (5.5) | 19 (15.5) | 21 |
| | Total | 15 | 42 | 57 |

Note: Numbers in parentheses are expected values.

### Hypothesis Two

There is no significant relationship between school board members' personally held beliefs regarding old earth creationism and the permitted inclusion of creationism in the school district science curriculum.

**Table 2.** Elective inclusion of creationism in the school district science curriculum and school board members' beliefs in old earth creationism.

| | | Belief in old earth creationism | | |
|---|---|---|---|---|
| | | Yes | No | Total |
| Permit the inclusion of creationism in science curriculum | Yes | 24 (27.9) | 21 (17.1) | 45 |
| | No | 21 (8.1) | 1 (4.9) | 13 |
| | Total | 36 | 22 | 58 |

Note: Numbers in parentheses are expected values.

Forty-five of the respondents reported that their districts permit the inclusion of creationism (see Table 2). Twenty-four of the 45 reported a belief in old earth creationism. The Chi-Square (6.508) and Phi (–.335) values both have significance values of (.011) and are therefore found to be significant ($p<.05$). Therefore the null is rejected. However, it is noted that the numbers in the "yes" cells for both belief in old earth creationism and inclusion of creationism were small which limits the conclusions which can be drawn from the data.

### Hypothesis Three

There is no significant relationship between school board members' personally held beliefs regarding young earth creationism and the required inclusion of creationism in the school district science curriculum.

Four of the respondents reported that their districts requires the inclusion of creationism (see Table 3). Two of the 4 reported a belief in young earth creationism. The Chi-Square (1.193). Significance of .275 is not significant ($p< .05$). Therefore the null is retained.

**Table 3.** Mandatory inclusion of creationism in the school district science curriculum and school board members' beliefs in young earth creationism.

| | | Belief in young earth creationism | | |
|---|---|---|---|---|
| | | Yes | No | Total |
| Require the inclusion of creationism in science curriculum | Yes | 2 (1.1) | 2 (2.9) | 4 |
| | Yes | 14 (14.9) | 42 (41.1) | 56 |
| | Total | 16 | 44 | 60 |

Note: Numbers in parentheses are expected values.

### Hypothesis Four:

There is no significant relationship between school board members' personally held beliefs regarding old earth creationism and the required inclusion of creationism in the school district science curriculum.

Four of the respondents reported that their districts require the inclusion of creationism (see Table Four). Three of the four reported a belief in old earth creationism. The Chi-Square (.028) and significance (.867) is not significant (.05). However, there is a lack of sufficient cell numbers to make a valid decision for this hypothesis.

**Table 4.** Mandatory inclusion of creationism in the school district science curriculum and school board members' beliefs in old earth creationism.

| | | Belief in old earth creationism | | |
|---|---|---|---|---|
| | | Yes | No | Total |
| Require the inclusion of creationism in science curriculum | Yes | 3 (3.1) | 1 (.9) | 4 |
| | No | 44 (43.9) | 12 (12.) | 56 |
| | Total | 47 | 13 | 60 |

Note: Numbers in parentheses are expected values.

## Discussion

A relationship between school board members who report a belief in young earth creationism and the districts' permitted inclusion of creationism in the science curriculum was noted. Fifteen out of 57 respondents (26.3%) indicated a belief in young earth creationism, thus young earth creationism is not the most commonly held belief in terms of the Christian view of creation. This study has established the likelihood that the permitted inclusion of creationism in the science curriculum is greater when the school board members report a belief in young earth creationism.

A significant relationship between school board members' belief in old earth creationism and the districts' permission to include creationism in the science curriculum was also found. A larger number, 24 out of 58 respondents (41.3%), showed belief in old earth creationism compared to thirteen out of 59 respondents (22%) who indicated a belief in young earth creationism (Tables 1 and 2). A positive relationship was found between board member's beliefs in young earth creationism and the inclusion of creationism. This study also established a negative relationship between a board member's belief in old earth creationism and the inclusion of creationism in the curriculum. This suggests that a belief by board members in old earth creationism is less likely to result in the inclusion of creationism in the science curriculum. However, because cell numbers were small and a response by only 66 subjects limits the conclusions which can be drawn. Thus the belief in one or the other (young earth creationism/old earth creationism) can not be considered a definitive indicator of *permitted* inclusion of creationism in the science curriculum as a result of this study.

In contrast, the *requiring* of the inclusion of creationism in science curriculum is not associated a school board member's corresponding belief in either young earth creationism or old earth creationism. School board members' perceptions of legalities may play a role in the decision to *require* the inclusion of creationism in the science curriculum as opposed to *permitting* it. Further study on this issue is needed.

## Recommendation for Further Study

This study excluded subjects who did not identify beliefs in either young earth creationism or old earth creationism; other beliefs were not studied. Because of the limitations of this study, a cause and effect relationship between subjects' beliefs in young earth creationism or old earth creationism and the inclusion of creationism in science curricula could not be ascertained. Therefore, future research should center on a cause and effect relationship between school board members' and beliefs in either young earth creationism or old earth creationism and the *permitted* or *required* inclusion of creationism in the science curriculum. Determining a cause and effect relationship would necessitate the use of appropriate research methodology.

Only 66 of the 144 board members surveyed responded. Because of the loss of data from these potential subjects, conclusions which can be drawn from this study are limited. Therefore, it is recommended that this study be replicated with a larger sample size.

In addition, it is recommended that this research be replicated in other states. Differences in results between "Bible-belt" states and "non-Bible-belt" states may be compared. Since board members are elected, political issues should be considered. Differences in results between states tending to vote Republican vs. states tending to vote Democratic (red vs. blue states) may be addressed.

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## Appendix A

***Survey questions for school board members***

| Questions | Yes | No |
|---|---|---|
| 1. Do you personally believe that God created the heavens and the earth? | | |
| 2. Do you believe in Young-Earth-Creationism? Young earth creationism is a biblical doctrine stating that earth was created recently by God about 6,000 years ago. | | |
| 3. Do you believe in Old Earth Creationism? Old earth creationism is the belief that God created the earth millions to billions of years ago. | | |
| 4. Do you believe evolution has occurred? For the purposes of this study, evolution is changes in organisms and other things from one type or form to another type or form over time. | | |
| 5. Do you believe macroevolution has occurred? Macroevolution is evolutionary change at the species level, creating a new species. | | |
| 6. Do you believe microevolution is happening at this point in time? Microevolution is genetic variation due to such things as natural selection and mutation. | | |
| 7. Does your county/district curriculum **permit** the inclusion of creationism in the science curriculum? | | |
| 8. Does your county/district **require** the inclusion of creationism in the science curriculum? | | |
| 9. Have you taken action to **support** the inclusion of creationism in the science curriculum in your county/district? Actions can include speaking out in public or in board meetings or encouraging others to support the inclusion of creationism in district science curriculum. | | |
| 10. Would you vote to **include** creationism in the science curriculum in your county/district? | | |
| 11. Have you taken action to **exclude** creationism from the science curriculum in your county/district? Actions can include speaking out in public or in board meetings or encouraging others to support the exclusion of creationism in district science curriculum. | | |
| 12. Would you vote to exclude creationism from the science curriculum in your county or district? | | |
| **Demographic Questions** | | |
| 13. Would you describe your district as: ___suburban ___rural ___urban? | | |
| 14. Gender: ___male ___female | | |
| 15. Age: ___under 20 ___20-29 ___30-39 ___40-55 ___over 55? | | |
| 16. Ethnicity: __Caucasian ___African American __Hispanic __Asian __Other | | |
| 17. Your highest educational level is: ___High School ___Some College ___4-Year Degree ___Educational Specialist ___Doctorate. | | |

## Appendix B

### *SPSS charts for Hypothesis 1, young earth creationism and the permitted inclusion*

**Case Processing Summary**

| | Cases | | | | | |
|---|---|---|---|---|---|---|
| | Valid | | Missing | | Total | |
| | N | Percent | N | Percent | N | Percent |
| 0=no, 1=yes, permits creationism *0=no, 1=yes, young earth creationism | 57 | 86.4% | 9 | 13.6% | 66 | 100.0% |

a 1=mailed, 0= emailed=0

0=no, 1=yes, old earth creationism *
0=no, 1=yes, permits creationism

**Crosstabulation**

| | | | 0=no, 1=yes, young earth creationism | | Total |
|---|---|---|---|---|---|
| | | | 0 | 1 | |
| 0=no, 1=yes, permits creationism | 0 | Count | 19 | 2 | 21 |
| | | Expected Count | 15.5 | 5.5 | 21.0 |
| | | % within 0=no, 1=yes, permits creationism | 90.5% | 9.5% | 100.0% |
| | | % within 0=young earth creationism | 45.2% | 13.3% | 36.8% |
| | | % of Total | 33.3% | 3.5% | 36.8% |
| | 1 | Count | 23 | 13 | 36 |
| | | Expected Count | 26.5 | 9.5 | 36.0 |
| | | % within 0=no, 1=yes, permits creationism | 63.9% | 36.1% | 100.0% |
| | | % within 0=no, 1=yes, young earth creationism | 54.8% | 86.7% | 63.2% |
| | | % of Total | 40.4% | 22.8% | 63.2% |
| Total | | Count | 42 | 15 | 57 |
| | | Expected Count | 42.0 | 15.0 | 57.0 |
| | | % within 0=no, 1=yes, permits creationism | 73.7% | 26.3% | 100.0% |
| | | % within 0=no, 1=yes, young earth creationism | 100.0% | 100.0% | 100.0% |
| | | % of Total | 73.7% | 26.3% | 100.0% |

a 1=mailed, 0= emailed=0

**Chi-Square Tests**

| | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---|---|---|---|---|---|
| Pearson Chi-Square | 4.835 | 1 | .028 | | |
| Continuity Correction | 3.561 | 1 | .059 | | |
| Likelihood Ratio | 5.401 | 1 | .020 | | |
| Fisher's Exact Test | | | | .033 | .026 |
| Linear-by-Linear Association | 4.750 | 1 | .029 | | |
| N of Valid Cases | 57 | | | | |

a Computed only for a 2×2 table
b 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.53.
c 1=mailed, 0=emailed=0

**Symmetric Measures**

| | | Value | Approx. Sig. |
|---|---|---|---|
| Nominal by Nominal | Phi | .291 | .028 |
| | Cramer's V | .291 | .028 |
| N of Valid Cases | | 57 | |
| | | | |

a Not assuming the null hypothesis.
b Using the asymptotic standard error assuming the null hypothesis.
c 1=mailed, 0=emailed=0

## Appendix C

### *SPSS charts for Hypothesis 2, old earth creationism and the permitted inclusion of creationism*

**Case Processing Summary**

| | Cases | | | | | |
|---|---|---|---|---|---|---|
| | Valid | | Missing | | Total | |
| | N | Percent | N | Percent | N | Percent |
| 0=no, 1=yes, old earth creationism* 0=no, 1=yes, permits creationism | 58 | 87.9% | 8 | 12.1% | 66 | 100.0% |

a 1=mailed, 0=emailed=0

0=no, 1=yes, old earth creationism *
0=no, 1=yes, permits creationism

**Crosstabulation**

| | | | 0=no, 1=yes, young earth creationist | | Total |
|---|---|---|---|---|---|
| | | | 0 | 1 | |
| 0=no, 1=yes, permits creationism | 0 | Count | 19 | 2 | 21 |
| | | Expected Count | 15.5 | 5.5 | 21.0 |
| | | % within 0=no, 1=yes, permits creationism | 90.5% | 9.5% | 100.0% |
| | | % within 0=no, 1=yes, young earth creationism | 45.2% | 13.3% | 36.8% |
| | | % of Total | 33.3% | 3.5% | 36.8% |
| | 1 | Count | 23 | 13 | 36 |
| | | Expected Count | 26.5 | 9.5 | 36.0 |
| | | % within 0=no, 1=yes, permits creationism | 63.9% | 36.1% | 100.0% |
| | | % within 0=no, 1=yes, young earth creationism | 54.8% | 86.7% | 63.2% |
| | | % of Total | 40.4% | 22.8% | 63.2% |
| Total | | Count | 42 | 15 | 57 |
| | | Expected Count | 42.0 | 15.0 | 57.0 |
| | | % within 0=no, 1=yes, permits creationism | 73.7% | 26.3% | 100.0% |
| a 1=mailed, 0=emailed=0 | | % within 0=no, 1=yes, young earth creationism | 100.0% | 100.0% | 100.0% |
| | | % of Total | 73.7% | 26.3% | 100.0% |

**Chi-Square Tests**

| | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---|---|---|---|---|---|
| Pearson Chi-Square | 6.508 | 1 | .011 | | |
| Continuity Correction | 4.957 | 1 | .026 | | |
| Likelihood Ratio | 7.758 | 1 | .005 | | |
| Fisher's Exact Test | | | | .011 | .009 |
| Linear-by-Linear Association | 6.395 | 1 | .011 | | |
| N of Valid Cases | 58 | | | | |

a Computed only for a 2×2 table
b 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.93.
c 1=mailed, 0=emailed=0

**Symmetric Measures**

| | | Value | Approx. Sig. |
|---|---|---|---|
| Nominal by Nominal | Phi | -.335 | .011 |
| | Cramer's V | .335 | .011 |
| N of Valid Cases | | 58 | |

a Not assuming the null hypothesis.
b Using the asymptotic standard error assuming the null hypothesis.
c 1=mailed, 0=emailed=0

## Appendix D

### *SPSS charts for Hypothesis 3, young earth creationism and the required inclusion of creationism*

**Case Processing Summary**

| | Cases | | | | | |
|---|---|---|---|---|---|---|
| | Valid | | Missing | | Total | |
| | N | Percent | N | Percent | N | Percent |
| 0=no, 1=yes, requires creationism * 0=no, 1=yes, young earth creationism | 60 | 90.9% | 6 | 9.1% | 66 | 100.0% |

a 1=mailed, 0=emailed=0

0=no,
1=yes, requires creationism *
0=no,
1=yes, young earth creationism

**Crosstabulation**

| | | | 0=no, 1=yes, young earth creationism | | Total |
|---|---|---|---|---|---|
| | | | 0 | 1 | |
| 0=no, 1=yes, requires creationism | 0 | Count | 42 | 14 | 56 |
| | | Expected Count | 41.1 | 14.9 | 56.0 |
| | | % within, 0=no, 1=yes, requires creationism | 75.0% | 25.0% | 100.0% |
| | | % within, 0=no, 1=yes, young earth creationism | 95.5% | 87.5% | 93.3% |
| | | % of Total | 70.0% | 23.3% | 93.3% |
| | 1 | Count | 2 | 2 | 4 |
| | | Expected Count | 2.9 | 1.1 | 4.0 |
| | | % within, 0=no, 1=yes, requires creationism | 50.0% | 50.0% | 100.0% |
| | | % within, 0=no, 1=yes, young earth creationism | 4.5% | 12.5% | 6.7% |
| | | % of Total | 3.3% | 3.3% | 6.7% |
| Total | | Count | 44 | 16 | 60 |
| | | Expected Count | 44.0 | 16.0 | 60.0 |
| | | % within, 0=no, 1=yes, requires creationism | 73.3% | 26.7% | 100.0% |
| | | % within, 0=no, 1=yes, young earth creationism | 100.0% | 100.0% | 100.0% |
| | | % of Total | 73.3% | 26.7% | 100.0% |

a 1=mailed, 0=emailed=0

**Chi-Square Tests**

| | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---|---|---|---|---|---|
| Pearson Chi-Square | 1.193 | 1 | .275 | | |
| Continuity Correction | .257 | 1 | .612 | | |
| Likelihood Ratio | 1.063 | 1 | .303 | | |
| Fisher's Exact Test | | | | .287 | .287 |
| Linear-by-Linear Association | 1.173 | 1 | .279 | | |
| N of Valid Cases | 60 | | | | |

a Computed only for a 2×2 table
b 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.07.
c 1= mailed, 0=emailed=0

**Case Processing Summary**

| | Cases | | | | | |
|---|---|---|---|---|---|---|
| | Valid | | Missing | | Total | |
| | N | Percent | N | Percent | N | Percent |
| 0=no, 1=yes, requires creationism * 0=no, 1=yes, young earth creationism | 35 | 92.1% | 3 | 7.9% | 38 | 100.0% |

a 1=mailed, 0=emailed=1

## Appendix E

### *SPSS charts for Hypothesis 4, old earth creationism and the required inclusion of creationism*

**Case Processing Summary**

| | Cases | | | | | |
|---|---|---|---|---|---|---|
| | Valid | | Missing | | Total | |
| | N | Percent | N | Percent | N | Percent |
| 0=no, 1=yes, requires creationism * 0=no, 1=yes,old earth creationism | 60 | 90.9% | 6 | 9.1% | 66 | 100.0% |

a 1=mailed, 0=emailed=0

0=no,
1=yes, requires creationism *
0=no,
1=yes, old earth creationism

**Crosstabulation**

| | | | 0=no, 1=yes, old earth creationism | | Total |
|---|---|---|---|---|---|
| | | | 0 | 1 | |
| 0=no, 1=yes, requires creationism | 0 | Count | 12 | 44 | 56 |
| | | Expected Count | 12.1 | 43.9 | 56.0 |
| | | % within 0=no, 1=yes, requires creationism | 21.4% | 78.6% | 100.0% |
| | | % within 0=no, 1=yes, old earth creationism | 92.3% | 93.6% | 93.3% |
| | | % of Total | 20.0% | 73.3% | 93.3% |
| | 1 | Count | 1 | 3 | 4 |
| | | Expected Count | .9 | 3.1 | 4.0 |
| | | % within 0=no, 1=yes, requires creationism | 25.0% | 75.0% | 100.0% |
| | | % within 0=no, 1=yes, old earth creationism | 7.7% | 6.4% | 6.7% |
| | | % of Total | 1.7% | 5.0% | 6.7% |
| Total | | Count | 13 | 47 | 60 |
| | | Expected Count | 13.0 | 47.0 | 60.0 |
| | | % within 0=no, 1=yes, requires creationism | 21.7% | 78.3% | 100.0% |
| | | % within 0=no, 1=yes, old earth creationism | 100.0% | 100.0% | 100.0% |
| | | % of Total | 21.7% | 78.3% | 100.0% |

a 1=mailed, 0=emailed=0

**Chi-Square Tests**

| | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---|---|---|---|---|---|
| Pearson Chi-Square | .028 | 1 | .867 | | |
| Continuity Correction | .000 | 1 | 1.000 | | |
| Likelihood Ratio | .027 | 1 | .869 | | |
| Fisher's Exact Test | | | | 1.000 | .634 |
| Linear-by-Linear Association | .028 | 1 | .868 | | |
| N of Valid Cases | 60 | | | | |

a Computed only for a 2×2 table
b 2 cells (50.0%) have expected count less than 5. The minimum expected count is .87.
c 1=mailed, 0=emailed=0