

THE RELATIONSHIP BETWEEN THE BELIEFS OF SCHOOL BOARD MEMBERS
CONCERNING YOUNG EARTH CREATIONISM AND OLD EARTH
CREATIONISM AND THE INCLUSION OF CREATIONISM IN THE
SCIENCE CURRICULUM OF GEORGIA PUBLIC SCHOOLS

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The Relationship between the Beliefs of School Board Members Concerning Young
Earth Creationism and Old Earth Creationism and the Inclusion of Creationism in the
Science Curriculum of Georgia Public Schools
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ABSTRACT

Karen Cook. THE RELATIONSHIP BETWEEN THE BELIEFS OF SCHOOL BOARD MEMBERS CONCERNING YOUNG EARTH CREATIONISM AND OLD EARTH CREATIONISM AND THE INCLUSION OF CREATIONISM IN THE SCIENCE CURRICULUM OF GEORGIA PUBLIC SCHOOLS (Under the direction of Dr. Steve Deckard) School of Education, June, 2007.

This study investigated district location and the beliefs of school board members regarding Young Earth Creationism (YEC) and Old Earth Creationism (OEC) associated with the inclusion or exclusion of creationism in the district science curriculum of Georgia public schools. A random sampling of 144 mailed of a total population of 1,034 local school board members was selected as subjects. Data analysis indicated that beliefs of school board members in Young Earth Creationism had a weak, positive association with the permitted inclusion of creationism in the district science curriculum while board member beliefs in OEC had a moderate, negative relationship. No association was found between board member beliefs in either Young Earth Creationism or Old Earth Creationism and the required inclusion of creationism in district creationism in Georgia public schools. Concerning district location (rural, urban, or suburban) and the permitted or mandatory inclusion of creationism, no relationship was found. The results of this study provide insight into connections between beliefs of board members and the inclusion of creationism, which may translate into enlightened voting decisions.

DEDICATION

This dissertation is dedicated to my parents, Merle and Leona Conway, who raised their children to be strong and independent. In addition, they taught us to love God. My father, now deceased, instilled us with a strong work ethic. Though she is now in a nursing home, Mother continues to be supportive. In large part, the woman I am today is due to her efforts.

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CHAPTER 1

INTRODUCTION

Associational aspects of the attitudes and beliefs of local school board members and their actions and voting decisions related to the inclusion of creationism in the district science curricula of Georgia public schools were investigated in this study. In numerous counties in Georgia, creationism and other Christian precepts have been the subject of public debate and have led to actions by district school boards. It was expected that the beliefs of local school board members would have a significant impact on the inclusion or exclusion of creationism in the school science curricula.

Voter opinion can be pivotal for both school board members because, in Georgia, local school board members are elected. Ultimately, the school board answers to the voting public. Because the creationism topic in science curricula is very controversial (and emotionally charged for many), it can be critical to members of the school board, especially when taking a public stance or voting on curricular issues. Views on this topic can affect election results.

Background of the Study

Several public opinion polls were reported in the Polling Report web site (Science and Nature, 2006). In a New York Times Poll (Nov. 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 & 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).

Clearly, these polls indicate a public interest in the inclusion of creationism in science curriculum. 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% approved, 29% apposed, and 3% had no opinion. In the same Gallop Poll, respondents were asked, “Please say whether you think each one should be required instruction, could be offered as an elective but should not be required, or should not be taught at all.” 28% indicated that the theory of evolution should be required, 49% believed it should be offered, 21% said it should not be offered, and 2% had no opinion. On the issue of creationism, 25% stated that it should be required, 56% indicated that it should be offered, 16% believed it should not be offered, and 3% had no opinion (Public, 2001).

Obviously, these polls also indicate public interest in the inclusion of creationism in science curricula. However, these polls do not directly address the specific issues researched in this study.

Problem Statement

Some local school districts in Georgia have grappled with the issue of creationism in science curricula. The relationship between school board members’ attitudes and beliefs on the creationism/evolution issue and the inclusion or exclusion of creationism in the district science curriculum is not known. Also, whether the relationship between the

subjects' beliefs and attitudes and the inclusion or exclusion of creationism in the district science curriculum varies by school district size has not been identified.

Professional Significance of the Study

The aim of this study was to identify possible relationships between beliefs/attitudes of school board members in Georgia and the district's permitted or required inclusion of creationism in science classrooms. Because several Georgia school boards (for example, Cobb and Hall) have been involved in the creationism/evolution curricular controversy, the identification of the relationship between school board members' beliefs and the inclusion of creationism is important. This identification could play a role in the election results of school board members who then (in Georgia) select superintendents. It could also lead to future studies in other states. The previous studies identified on this topic had somewhat conflicting results. Also, they did not specifically target Georgia; rather, they are national studies of school board members or public opinion, and they do not investigate the relationship between board members or district location in the inclusion of creationism in district science curriculum.

In Deckman (2002), a survey of prospective school board members noted that a Judeo-Christian worldview produced a clear connection with attitudes supporting creationism. This connection was found to be stronger as the frequency of church attendance of respondents increased. By identifying connections between worldviews of board members and local creationism curricular decisions, the public can better understand factors which influence the inclusion or exclusion of creationism in local science curriculum which may translate into enlightened voting decisions (Deckman, 2002).

Georgia has been affected by the creationism curricular controversy. In 1996, the Hall County School Board adopted a policy requiring instructors to teach creationism along with evolution. At this time, the state legislature considered mandating creationism along with evolution instruction (Applebome, 1996). In Cobb County, a petition was circulated by citizens with over 2,300 signatures requesting the removal of a chapter on evolution in a fourth-grade text. The board responded by placing evolution disclaimer stickers in the texts (Georgia school board, 2002); the removal of these disclaimer stickers was ordered by a federal judge in 2005. The creationism/evolution issue also affected the board membership. For example, on August 8, 2006, Kathie Johnstone lost her position on the Cobb County school board in part due to the evolution-disclaimer sticker issue (Stepp, 2006). It is clear that this issue can have a great impact on local school systems.

Research Questions and Hypotheses

Research Question 1

Research Question 1 asked “What is the relationship between school board members’ personally held beliefs 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_01 : 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_02 : 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_{03} : 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_{04} : 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.

Research Question 2

Research Question 2 asked “Is school district location (rural, suburban, and urban) associated with the permitted inclusion of creationism in the school district science curriculum?”

The following null hypothesis was created based on the third research question:

H_{09} : There is no significant association between school district location (rural, suburban, and urban) and the permitted inclusion of creationism in the school district science curriculum.

Research Question 3

Research Question 4 asked “Is school district location (rural, suburban, and urban) associated with the required inclusion of creationism in the school district science curriculum?”

The following null hypothesis was created based on research question 3:

H_{010} : There is no significant association between school district location (rural, suburban, and urban) and the required inclusion of creationism in the school district science curriculum.

Definitions

The definitions of the terms in this section are based on the use in this study:

Attitudes-“enduring, learned predisposition to behave in a consistent way toward a given class of objects, or a persistent mental and/or neural state of readiness to react to a

certain class of objects, not as they are but as they are conceived to be.” (Attitude, 2005, para. 1)

Belief-a “conviction of the truth of some statement or the reality of some being or phenomenon especially when based on examination of evidence.” (Belief, n.d., para 1).

Creationism-“a doctrine or theory holding that matter, the various forms of life, and the world were created by God out of nothing and usually in the way described in Genesis.” (Creationism, n.d., para. 1)

Evolution- “change in the hereditary characteristics of groups of organisms over the course of generations.” (Bennett, 1999, p. 1)

Curriculum-“is the totality of learning experiences provided to students so that they can attain general skills and knowledge at a variety of learning sites.” (Marsh & Willis, 2003, p. 9)

Intelligent Design, Conservative Christian Definition-the Judeo-Christian God created man and the physical world (Intelligent designer, n.d.).

Intelligent Design, Liberal Definition-intelligent designer took an active part in the development of life on earth, and that natural selection cannot explain the characteristics of the universe and living things (Intelligent designer, n.d.).

Macroevolution-“evolution that results in relatively large and complex changes (as in species formation).” (Macroevolution, n.d., para. 1)

Microevolution-“comparatively minor evolutionary changes involving the accumulation of variations in populations usually below the species level.” (Microevolution, n.d., para. 1)

Old Earth Creationism (OEC)-“the universe, the earth, and all living things were created by God, but that the Universe is very old.” (C. E.-Dualism, n.d., para. 44).

Science-a framework of information dealing with the design and the casual (or working) relationships of material and time-space aspects of the cosmos (Deckard, 1996, p.7).

Young-Earth Creationism (YEC)-The Bible delineates the account of earth’s six-day creation, dating the earth at only a few thousands of years old (Ham, 1998, p. 1).

Worldview-The presuppositions, orientations, and beliefs that act as a filter or screen through which to interpret life.” (Deckard, 1994, p. 1) .

CHAPTER II

REVIEW OF THE LITERATURE

The Role of School Board Members in the Inclusion/Exclusion of Creationism in Science Curriculum

This literature review surveys the theoretical and empirical evidence relating to the role school board members throughout the United States in district decisions to include or exclude creationism from science curricula. It examines existing studies of district control over curriculum decisions, politics, the interplay of federal, state, and court regulations (including No Child Left Behind), and stakeholder influences are investigated in this chapter. Specifically, the relationship between attitudes and beliefs on the creationism/evolution curricular issue and the inclusion of creationism is examined. This chapter also offers an overview of methodological research on multi-mode surveys and other related studies.

The Role of School Board Members Regarding the Creationism Issue

In this section the role of local board members is discussed in a historical context. This national overview of board member roles is organized in chronological. The section concludes with a summary of these roles on this issue.

Board Members Initiate Efforts to Include or Exclude Creationism

The New Lenox School Board of New Lenox, Illinois ordered a junior high social studies teacher to exclude creationism from his classroom curriculum in response to a student complaint on July 31, 1987. The teacher filed suit citing violations of his First

and Fourteenth Amendment rights. However, the court found in favor of the board (Renick, 2004).

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 at the September 26 board meeting. 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 IBD, 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, 2005; Judge, Jan.13, 2005; Marus, R., Jan. 21, 2005; Matzke, N., 2006; Selman, 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). According to the *Marietta Daily Journal's Online Edition*: “We suspect that most Cobb residents are tired of their local school board going out of its way to be controversial with things like the ‘evolution sticker.’ We suspect they are tired of having a school board whose credibility is in tatters and has spent megabucks on legal fees trying to defend its decisions.” (Time for new blood, 2006, para. 12)

In 1996, the Hall County School Board in Gainesville, Georgia adopted a policy which called for teachers to include creationism along with evolution in science class. During this time Linda Schrenko was Georgia State School Superintendent and a supporter of creationism. The state legislature was considering a bill permitting the inclusion of creationism (Applebome, 1996).

The school board of Tangipahoa Parish in Louisiana passed a policy document which required teachers to read a statement before beginning a unit on evolution. The document stated that evolution “should be presented to inform students of the scientific concept and not intended to influence or dissuade the Biblical version of Creation or any other concept.” (Scott, 1997, p. 282)

The Kanawha County Board of Education in West Virginia was presented with a resolution by a board member to include creationism in the science curriculum on December 16, 1999. The board rejected a resolution after the ACLU and the Americans for Separation of Church and State threatened a lawsuit (Creation story, 1999; Learning, 1999; Priest, Jan./Feb. 2000; WV, 2000). However, the controversy continued after this rejection, led by some teachers and constituents who support creationism (WV, 2000).

School board members in Patrick Henry School District of Columbus, Ohio encouraged science teachers to include Intelligent Design in lessons concerning how life originated and changes in June of 2002. The majority of the members of the Standards Committee supported the policy. However, the full board was divided (Sidoti, 2002).

Liberty School Board in Joes, Colorado initially voted unanimously to permit the inclusion of creationism in the district’s curriculum. Douglas Sanford, board member and Baptist minister, led the fight for the creationism proposal. However, the policy was

rescinded after the Americans United for the Separation of Church and State warned the board of legal action (Town's schools, 2002).

In October of 2003, a board member in Washakie County, Wyoming backed a proposal permitting the teaching of Intelligent Design in science classes as a choice over evolution. The board policy stated that evolution is a theory and teachers should objectively introduce all scientific theories and evidence (Schneider, 2003).

In Montana, the Darby School Board established an "objective origins" policy which allows creationism and Intelligent Design to be taught in science classes (GCISE, 2004, p. 1). After the membership of the board changed, the support for the "objective origins" policy was decreased (Evans, S & Branch, G, n.d.; Williams, May, 29, 2004; Dec. 30, 2004). The policy was rescinded in a 3-2 vote in July of 2004 (Johnson, 2004).

During 2003, the Cody school board in Wyoming adopted a set of guidelines permitting the discussion of creationism. The superintendent stated that the purpose of the guidelines is to clarify the legalities for the teachers so as to ensure compliance involving the separation of church and state (Schneider, 2003).

For most of a year, the board of trustees in Roseville Joint School District, near Sacramento, California, debated a proposal mandating alternatives to evolution. The board president and one member were the only supporters. "The Quality Science Education Policy" was voted down on June 1, 2004 (Price, 2004, p.1).

The Grantsburg, Wisconsin school board revised the wording to the science curriculum to add the inclusion of "various model/theories" of origin in October of 2004. State law mandates the teaching of creationism which the board found to be too restrictive (Creationism, 2004; Petto, A., Nov. 2004; Wisconsin board, Dec. 8, 2004;

Wisconsin city, Nov. 8, 2004; Wisconsin school, Nov. 6, 2004). The president of the school board was also a local Baptist minister (Creationism, 2004).

The Dover School Board in Dover, Pennsylvania became the first district to mandate Intelligent Design on October 18, 2004. School board member and head of the board's curriculum committee, William Buckingham, led the movement to revise the district's curriculum. Through Buckingham's support of creationism and Intelligent Design, his bend toward creationism was evident (Raffael, 2004). The district lost the subsequent court case on the Intelligent Design curricular issue in 2005 (Kitzmiller, 2006; Lawrence, 2005; Taibbi, 2005; Toland, Jan. 9, 2005). The day before the court case, eight of the school board members who were up for reelection lost to challengers who opposed I.D. (Lawrence, 2005; Toland).

In Arkansas, the Beebe School Board required evolution disclaimer stickers on science textbooks. The sticker stated that some people believe that life was created by an "intelligent designer." The ACLU claimed that this sticker was a violation of the First Amendment. On February 10, 2005, the board decided to remove the stickers as a response to an ACLU threat of legal reprisals (McCoy, 2005).

Two board members were elected to the top two leadership positions on the Charles County BOE in Maryland. They were on the committee which designed the "6000 policy series" document in 2005. The document listed goals and recommendations and permitted a religious group to pass out Bibles in school. The plan was supported by Margaret Young (board chairman) and Jennifer Abell (a newly elected member who was appointed vice chairman) drafted policy 6000 which was opposed by the previous chairman (Partlow, 2005).

School boards in districts throughout various states have made decisions which impacted evolutionist theory negatively. School boards in Oklahoma and Alabama placed evolution disclaimer stickers in biology textbooks. Also, in Arizona, Alabama, Illinois, New Mexico, Texas, and Nebraska, school boards attempted to modify the teaching of evolution in 1999 (Heuvel, 2004).

Summary of School Board Members' Roles Regarding the Inclusion of Creationism

In the vast majority of the cases identified, board members took the lead in curricular decision-making concerning the creationism/evolution issue or Christian principles (including intelligent design). Twenty-three cases were cited in which the school board initiated the move to include or exclude creationism or Christian principles in the curriculum. This indicates that the school board may be the most significant change agent regarding the creationism/evolution curriculum issue. (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, Dec. 30, 2004; Wyatt, 2000).

Factors Affecting Curricular Decisions Concerning the Creationism/Evolution Issue

When district school board members set curricula for Georgia public schools, they must adhere to state objectives, known in Georgia as standards. These standards are a set of minimum skills that students are expected to master. Districts may include additional objectives or skills in the curriculum in addition to the state standards (Science standards, n.d.). However, these additional objectives must not violate any state or federal regulation or any court orders. The creationism/evolution science curricular issue is a point of

contention when balancing legalities, regulation, beliefs, and worldviews (Deckman, 1999, 2000).

Court Involvement in the Creationism/Evolution Curricular Issue

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, Jan. 9, 2005). In this ruling, the justices stated, "We do not imply that a legislature could never require that scientific critiques of prevailing scientific theories be taught." (Toland, para. 26) The scientific critique of theories is at the crux of the controversy, permitting discussions of alternative theories without religious indoctrination. Often, the views of constituents, district school officials, evolutionists, and Christian organizations clash with government regulations, politics, and court rulings (Bennett, 1999; Deckman, 1999, 2000; Evans, S & Branch, G., n.d.; Holden, 2002; Schlafly, 1984; Taylor, 2007; Tenneson, 2001). Lawsuits (or threats of lawsuits) by the opposition have resulted in the removal of creationism from many district science curricula (Associated, 2005; Judge, Jan.13, 2005; Kitzmiller, 2006; Lawrence, 2005; Marus, R., Jan. 21, 2005; Matzke, N., 2006; Renick, 2004; Selman, 2005; Teaching, 2004; Toland, Jan. 9, 2005; Town's schools, 2002).

Courts have generally stuck down the teaching of Christianity (Hutton, 2003; Matsumura, M., February 15, 2001; Scott, 2000; Tennison, 2001; Toland, 2005), religious celebrations, or the "opting out" of religious instruction. However, courts have supported the teaching of comparative religions. They also have permitted the required

participation in cultural history activities as long as religious rituals are not included (Hutton, 2003).

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 of 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, 2006; Selman, 2005; Science standards, n.d.; Tenneson, 2001). However, the impact on politics by the Christian Right has dramatically changed the curriculum in many districts (Deckman 1999, 2001).

Politics and the Creationism/Evolution Science Curriculum Controversy

The New Christian Right is active in educational politics. It supports a broad agenda, including religious issues (such as evolution and creationism), local control, and academic reforms such as vouchers and parental rights. Current Christian activism focuses on politics, including school board elections. In many school districts, the school climate offends conservative Christians on spiritual and moral issues. Several prominent Christian leaders such as Pat Robertson, Bob Simonds, and Phyllis Schlafly are in conflict with public schools. These leaders predict that secular humanism will take over public education soon, leaving the minds of students vulnerable. Therefore, especially since 1990, Christian Right groups have mobilizing a grassroots effort to provide support for political action against this threat. Learning from the Civil Rights Movement, the Christian Right is providing critical resources to effect success in promoting their

political agenda (Deckman, 1999). Liberty University's Liberty Counsel supports the Christian Right political agenda by challenging anti-Christian and anti-creationism policies and actions in local school districts (Burke, 2007; Metro, 1999; Religious right, 2000; Taylor, 2007)

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, May 29, Dec. 30, 2004). The Christian Right organizations, dealing with attacks on religion in public schools, are mobilizing the Christian community. Actions range from calling on parents to remove children from public schools, placing them in Christian schools to home schooling their children. This has lead to the call by the Christian Right for vouchers or tax credits to allow all Christian parents access to the private schools. Citizens for Excellence in Education (CEE) and the Christian Coalition are two of the national organizations leading this fight to involve followers in the political arena. The Christian Right is encouraging Christians to run for local office, including the school board. In some cases, candidates are recruited and trained to maximize the promotion of creationism and other Christian Right issues, as well as methods to counter opposition. These recruits are running for various offices, including local school boards. On a broader scale, the Christian Right has spent millions of dollars lobbying the legislatures (Combs, n.d.; Deckman, 1999, 2001; Simonds, B., n.d.; Understanding, n.d.).

The controversy concerning creationism in the curriculum is cited as an example of the political and intellectual divide between 'red states' and 'blue states': that is, those states that vote predominantly for Republicans or Democrats respectively in presidential

elections (Red, n.d.). According to Taibbi (2005), many blue-state intellectuals view the creationism/evolution curricular issue as a modern-day Scopes monkey trial, ridiculing district actions to include creationism. In the Dover case, board members mandated instruction in intelligent design which was quickly met with a lawsuit filed by parents opposing the curricular change. Rural district, such as Dover, tend to be Democratic in Pennsylvania, while the larger urban areas tend to be Republican. In contrast to the blue-state views, Gardner (2006, Jan. 6) noted that the Republican governor of Texas, Rick Perry, supported the inclusion of intelligent design along with creationism. The politics concerning the evolution/creationism controversy has affected changes in the election of board members (Deckman 1999, 2001; Toland, 2005; Stepp, 2006; Williams, May 29, Dec. 30, 2004). Politics also affects court decisions. The judge who ruled against Cobb County's use of a disclaimer sticker was a Clinton appointee (Schlafly, Aug. 21, 2006). This evidence suggests that the politics involved in the creationism/evolution affects curricular decisions on the local level.

Georgia has been a traditionally Democratic state in both local and national elections. However, Georgia has increasingly "reddened" due to common ideologies with the conservative national Republican platforms. George W. Bush's conservative administration has rallied the support of evangelicals throughout Georgia as well as the rest of the Bible "belt". For example, popular former Democratic governor, Zell Miller, has supported the conservative Republican platforms during his stint in the U.S. Senate. This "reddening" of Georgia has resulted in more efforts to include creationism in school curriculum are sometimes countered by court cases. In contrast to Pennsylvania, the

conservative Christian worldview of stakeholders is common in metropolitan areas as well as rural ones (Jeffrey, July 5, 2004).

Politics can be affected by beliefs and attitudes. This can be especially true when the belief system is a highly-charged emotional or religious issue. Religious beliefs can result in a mobilization of grassroots and/or national actions. Local controversies with religious overtones can mobilize a national religious base, which in turn can impact other localities. Politics can affect the power local school boards have over the inclusion or exclusion of creationism in district science curricula (Baker & Sleven, 2005; Combs, n.d.; Gardner, 2006; Gold, 2004; Petto, 2004; Priest, 2000; Simonds, n.d.; Toland, 2005). It is evident that politics, court decisions, government regulations, attitudes, and beliefs affect the actions of board members concerning the inclusion of creationism.

No Child Left Behind has had a dramatic effect on local school board power. It is a driving force in curricular decisions especially when considering academic performance with target populations. Accountability is the watchword. Each state has the responsibility of determining how Adequate Yearly Progress (AYP) will work within their specific accounting system which is then subject to stringent approval system managed by the federal government. Additional funding for schools failing to meet AYP is accompanied by close federal monitoring. Students in schools not meeting AYP may transfer to schools that have, which places additional stressors on local districts (AYP). Enrollment numbers in schools which make AYP are difficult for local school board to predict. Concerning funding and NCLB, schools qualify for Title 1 funds if more than 40% or the students receive free or reduced lunches. However, with this funding come the stringent mandates of NCLB. Some districts are considering opting out of this

funding because the elaborate testing and remediation mechanisms are overwhelming: testing, during-school remediation, after-school remediation, and private remediation. If a group within the school continues to fail the state testing, that school may be identified as Needs Improvement even though all other groups within the school meet the benchmark scores. Benchmarks are set to increase in subsequent years, making it more difficult to make AYP in the future. The consequences for continued failure are significant for schools. Replacement of the school staff and state take-over of the failing school are possible consequences. Prior to NCLB regulations, states were free to assess special education students and English language learners as they saw fit. However, under NCLB only severe and profound students are exempted from mandated testing. (AYP, 2003; District, 2006; Local, 2003; NCLB, March 6, 2006). All of these regulations limit the control or influence the school board has over district curriculum decisions.

The Influence of the Local School Board Regarding Curricular Decisions

By and large local school boards may see their responsibilities as managing the routine functioning of the district while leaving the legal and educational issues up to the superintendent. Because the superintendent is considered the educational expert, the technical aspects of managing a school district generally fall on the superintendent while the routine issues tend to be handled by the board (Dowling-Sendor, March, 2001; Hentges, March 9, 1985; Russell & Adkins, July, 2004; Woodrum & Hoban, 1992).

In recent years, the board has experienced an erosion of control over local curricula. This erosion is a result of court rulings, state regulations, and federal regulations which decrease local power in curricular matters. In a survey of school boards by the ASBJ, respondents reported an increasing loss of control. In the survey, 50%

identified state and federal regulations as the culprits for the loss of school board power, 35% named local and national special interest groups as contributing factors to this power loss, and 2% blamed the special interest groups exclusively for the erosion of school board power. Only 13% indicated no loss of local school board control. No Child Left Behind, special education regulations, and (for some districts) union control have combined to limit budget and curricular decisions, leaving some board members to feel that their duties have been relegated to rubber-stamping the decisions of others. Also, many board members feel tremendous pressure resulting from financial constraints from state and federal legislation, politics, public relations, and meeting the needs of the students in the district (Your turn, 2006). Because most school board members believe that their power is being increasingly limited, this perceived limitation will affect all curricular decisions. Due to NCLB, despite site-based management and the historical control of local school boards, local school districts have less control over major curricular issues (Cook, G., 2006, January; Jehlen, 2006, April; NCLB, March 6, 2006; Odland, 2006, 2006/2007, Winter; Your turn, 2006). In addition, the courts and special interest groups have further reduced board control (Andero, 2000; Deckman 1999, 2002; Matsumura, February 15, 2001; Schlafly, Aug. 21, 2006; Taibbi, 2005; Toland, 2005)

NCLB has added to the regulations which limit the power of the school board. In order to qualify for federal funding, districts must abide by NCLB regulations involving high-stakes testing for nearly all students, required yearly improvements, remediation programs, and strict consequences for poor-performing schools. All of these regulations severely limit the power of the local district (Child, n.d.; Cook, 2006; Jehlen, 2006; NCLB, March 6, 2006; Odland, 2006/2007, Winter). Increasingly, NCLB and state and

federal legislative decisions have been usurping the control of the local school boards (Andero, 2000; Cook, G., 2006, January; Jehlen, 2006, April; Odland, 2006, 2006/2007, Winter; Your turn, 2006).

No Child Left Behind, District Control, and Creationism

According to Baker & Slevin (Aug. 3, 2005), although President Bush has stated that he believes that intelligent design should be taught along with evolution and that local districts should have latitude in curricular decision making, NCLB limits both. However, Toland (2005) had different views of the NCLB and creationism inclusion in the science curriculum. Concerning science instruction specifically, NCLB states: "Where topics are taught that may generate controversy (such as biological evolution), the curriculum should help students to understand the full range of scientific views that exist." This may permit the inclusion of Intelligent Design in district science curricula (Toland, 2005).

Because the stringent regulations of NCLB have limited district control, many districts are calling for reforms, dismantling, or opting out of NCLB. According to some, the increasing numbers of needs improvement schools indicate changes should be made especially in areas of accountability, local student needs, school choice regulations, and funding. NCLB drastically affects local control over curricular matters. (Child, n.d.; Q&A, Feb. 2007).

Summary of Factors Affecting Curricular Decisions Concerning Creationism

The connection between beliefs and attitude is significant, and both can be impacted through science instruction beliefs (Crisp, 2006, Deckard, 2002). However, the power of the local school board over curricular decisions is affected by decisions on the

state and national level and by court decisions (Toland, 2005; Your turn, 2006). In Georgia, the Georgia science standards are mandated (Science standards, n.d.).

Georgia Curriculum Science Standards

District science curricula are in large part governed by state standards or objectives. At times, the school biology and science teachers may disagree with state standards. Randy Moore and K. Kraemer (2005) studied biology teacher attitudes toward the creationism/evolution science curricular issue in Minnesota. It was found that despite religious beliefs, biology teachers generally favor teaching evolution (excluding creationism) in science class (MacDonald, G. J., May 3, 2005; Moore & Kraemer, 2005; National, 1997; Rosenthal, 2006, Jan.; Slevin, P., May 5, 2005). No state reported the inclusion intelligent design in their state standards in 2005 survey by *Education Week* (Rosenthal, 2006, Jan.). In the same survey, it was found that 39 states include evolution in their science standards. According to Moore (2001) ten states do not use the term evolution in their science standards.

The state standards guide district curricula. Even in states, like Georgia, with less stringent standards for the teaching of evolution, a relatively large percentage of biology teachers support the inclusion of creationism in science classes. However, some teachers actually teach creationism while others deemphasize evolution (Moore, 2001). Fifty studies surveying opinions on teaching origins in public schools were reviewed by Bergman (1999). About 15% of high school teachers teach both evolution and creation. Also, nearly 20% of high school science teachers and about 10,000 scientists do not believe in macroevolution or theistic evolution. This suggests that evolution is not supported by all scientists or science educators (Bergman, 1999). Anti-evolution

disclaimers stickers also tend contribute to poor evolution instruction which is prevalent in the Bible “belt” (Moore, 2001). State and federal regulations, legalities, and the opinions of state-level educators all form the cornerstone of curricular decisions on the district level.

Georgia has adopted new curriculum guidelines called Georgia Performance Standards (GPS) which was instituted in 2005. Faculties have undergone training on the new, more general standards throughout the state. The science guidelines are divided into the following categories: K-5, 6-8, and 9-12 (Science standards, n.d.).

In the K-5 science standards, no mention is made of creationism or evolution. The accompanying tasks for grades 1-5 also make no reference to creationism or evolution. Concerning life in the K-2 descriptors, students are expected “to build a knowledge base of biodiversity.”(Science standards, n.d., p. 4) While topics of high interest such as extinct creatures are included, the major focus in this area is the observation of organisms in the child’s world (Science standards, n.d.).

The science GPS for grades 6-8 also makes no mention of creationism or evolution. However, again, the “diversity of life” is included. Genetics, classification of organisms, and ecosystems are also components of the standards for this level. Additionally, the science tasks for each grade level make no mention of creationism or evolution (Science standards, n.d.).

On the 9-12 level, evolution is included in the GPS Biology section. Under the section, Habits of Mind, the following is a standard for Biology students: SCSH1 “Students will evaluate the importance of curiosity, honesty, openness, and skepticism in

science.” (Science standard, n.d., p. 3) However, there are many standards dealing with evolution:

- The basic idea of biological evolution is that the earth’s present-day species developed from earlier, distinctly different species. SB 5b
- Molecular evidence substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched off from one another. SB 5b
- Natural selection provides the following mechanism for evolution: Some variations in heritable characteristics exists within every species, some of these characteristics give individuals an advantage over others in surviving and reproducing, and the advantaged offspring, in turn, are more likely than others to survive and reproduce. The proportion of individuals that have advantageous characteristics will increase. SB 4efg
- Heritable characteristics can be observed at the molecular and whole-organism levels-in structure, chemistry, and behavior. These characteristics strongly influence what capabilities an organism will have and how it will react, and therefore will influence how likely it is to survive and reproduce. SB 5b
- New heritable characteristics can result from new combinations of existing genes or mutations of genes in reproductive cells. Changes in other cells of an organism cannot be passed on to another generation. SB 2e 5b
- Natural selection leads to organisms that are well suited to survival in particular environments. Chance alone can result in the persistence of some heritable characteristics having no survival or reproductive advantage or disadvantage for

the organism. When an environment changes, the survival value of some inherited characteristics may change. SB 4ef

- The theory of natural selection provides a scientific explanation of the history of life on earth as depicted in the fossil record and the similarities evident within the diversity of existing organisms. SB 5bc
- Life on earth is thought to have begun as simple one-celled organisms about 4 billion years ago. During the first 2 billion years, the one-celled microorganisms existed, but once cells with nuclei developed about a billion years ago, increasingly complex multi-cellular organisms evolved. SB 5b
- Evolution builds on what already exists, so the more variety there is, the more there can be in the future. But evolution does not necessitate long-term progress in some set direction. Evolutionary changes appear to be like the growth of a bush: Some bushes survive from the beginning with little or no change, many die out altogether, and others branch repeatedly, sometimes giving rise to more complex organisms. SB 5bd (Science standards, biology benchmark link, p.2).

Noticeably absent from any of these standards, descriptors, or tasks is any reference to creationism. In fact, no mention of evolution is found in the GPS list until high school level. However, these GPS guidelines do not necessarily mean that creationism is excluded from district curriculum. According to Marsh and Willis (2003), curriculum also includes the totality of student experiences. Using this definition, stickers on science textbooks (like those used in Cobb County) are part of the curriculum. Additionally, the selection of supplemental materials which include creationist ideology would also comprise curricular materials.

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

According to creationism, the earth was created by God out of nothing as described in Genesis (Creationism, n.d.; Deckard, 1992, 1994, 1997, Deckman 1999, 2001; Ramer, R., Winter, 1994; Tenneson, 2001). Young Earth Creationists believe that God created the earth and living things, accepting the Old Testament account literally, maintaining that the earth is only a few thousand years old (C. E.-dualism, n.d.; Ham, 1998; Morris, n.d.; Scott, E., Dec. 7, 2000; Young Earth, n.d.). Old Earth Creationists believe that the earth was created by God, but that it is very old (C.E.-dualism, n.d.; Morris, n.d.; Scott, E., Dec. 7, 2000; Old Earth, n.d.). The Georgia origins standards clearly are based on an evolutionary worldview.

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 (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, C. & Willis, G., 2003), other experiences planned by a school or district may include creationism. For this reason, the attitudes of school board members toward the inclusion of creationism in the curriculum are important.

Attitudes and Beliefs and Worldviews of Board Members and Students Regarding Creationism

Attitudes, Beliefs, and Worldviews of Students Relating to Creationism Issue

According to research by Overman (Aug. 3-8, 1998), the more a person believes in creationism, the more positive the person's moral view will be. This solidifies an individual's worldview, despite the emphasis on evolution found in most science classrooms. In addition, Deckard and Sobko (Aug. 3-8, 1998), state:

A student's beliefs (worldview) affect his or her understanding about scientific knowledge and thus about how science works. At a more fundamental level, the student's belief system affects his or her interest in science. Because these and other factors are present within the student before entering the science classroom, it is important for the teacher to be able to discern the student's worldview (creationism/evolutionism). Thus, the need for being able to measure a student's worldview as it relates to creation/evolution is established. (para. 8)

Also, an individual's beliefs have a direct impact on attitudes regarding the inclusion of creationism in the science curriculum according to Deckman (1999, 2001). Crisp (April 21, 2006), an evolutionist, studied beliefs and attitudes of college science students on this issue. From the fall of 2005 to the spring of 2006, a study was conducted at West Virginia University of science majors, over 50% of which were prospective teachers. The study included pre- and post-course attitudinal surveys concerning the inclusion of creationism in science curriculum. 59% of the students reportedly supported this inclusion, though only 57% reported a personal belief in

creationism. After the student course completion in varied science disciplines, the post-test was administered. Only 49% support the inclusion of creationism in the science curriculum, and only 51% reported a belief in creationism in the post-course survey. The results of this survey indicate a connection between belief and attitudes regarding the inclusion of creationism in science curricula. Studies by Deckard (2002) and Deckard and Sobko (Aug. 3-8, 1998) also found a connection between beliefs and attitudes toward the inclusion of creationism. These studies also suggest that education can affect a change in both attitudes and beliefs. This possible change in attitudes and beliefs may be at the core of the battle to include or exclude creationism in district curricula.

Clearly, many students have definite preconceived notions on the creationism/evolution issue (Crisp, 2006; Deckard, 1998, 2002; Deckard, et al., 2004; Deckard & Sobko, 1998; Tenneson, 2001). Consequently, current research indicates that instructors should use a non-confrontational and non-threatening approach when dealing with this issue. Teachers are not required to classify the creationism/evolution controversy as a dichotomy. Students are not expected to side with “religious” creationism or “atheistic” evolution. Many well-informed individuals hold intermediate positions on the creationism/evolution continuum (Tenneson, 2001).

According to Tenneson (2001), “Science educators, in response to public opinion and governmental and legal pressures, have recently invested much effort in the reform of evolutionary instruction...It has been determined that college student biological literacy is low.” (p. 68) The combination of these factors has placed great emphasis on the “science” of science.

A critical component for resolving the dichotomy between creationism and

evolution is the proper training of science educators. While many public colleges do not include creationism in the science curriculum, some institutions are filling this gap. For example, the Institute for Creation Research offers four Master's degrees in science education. A science major must be able to synthesize ideas and concepts from multiple disciplines. Unfortunately, a chemistry major, for example, has little exposure to geology. Yet, a prospective secondary teacher may be required to teach geology when employed as a classroom instructor. Due to the multidisciplinary nature of science, it is therefore logical to integrate them under a Biblical worldview, thus allowing the blending of the varied disciplines into a more holistic approach (Deckard, 1994, Nov. 1996; Dec. 1998; Morris, May 1996).

Deckard (1994) asserts that there are various ways of integrating the science curriculum with faith. Because origins education encompasses many science fields, merging them under Biblical concepts and teachings widens the horizons for students. Deckard has devised a model for this. His four-component model is based on a creationist worldview with Jesus Christ as the creator. Common sources of knowledge (experience, authority, deductive and inductive reasoning, and the scientific method) are all limited while the creationist view is based on Biblical truths. To arrive at the truth, creationism must be included (Deckard, 1994).

Arriving at the truth requires one to be open to investigation. According to Tenneson (2001), it should not be the goal of science class to persuade students to believe in evolution and discard creationism. Rather it should be the purpose to teach students to question the nature of science, to identify questions that science can or can not answer, and to identify evidence that supports particular positions. To this end, on the

creationism/evolution curricular issue, a possible solution would be to teach the cultural history of Darwinism along with a classroom discussion of the essential questions on the creationism/evolution issue. This would allow students to use prior knowledge of both creationism and evolution without alienating students (Tenneson).

In the science curriculum, truth is the principal concern. Truth is also important in developing worldview. Deckard (1996) researched the development of one's worldview through the use of science, including evolutionary theory. This leads to spiritual as well as intellectual growth. One's worldview should be evident to others, according to Deckard. However, developing this worldview requires consideration of the "Christian Creationist" worldview as well as science to arrive at the truth. Those who remain fixated on scientific method exclusively will find themselves missing other critical methods of "knowing." Deckard states, "Experience, authority, deductive reasoning, inductive reasoning, the scientific method, and revelation from God are all methods that have been used historically to find knowledge." (Deckard, 1996, p. 1) In many cases, scientists do not seek the truth; they often are fixed on theories to explain or predict natural occurrences (Deckard, 1996).

Curricular decisions should be focused on truth. Science education must not be limited to theories. To arrive at the truth, beliefs, attitudes and worldview viewed as vital components of effective science instruction. However, to include beliefs, attitudes, and worldviews in the district curriculum, curriculum changes may be necessary. Attitudes, beliefs, and worldviews of district change agents are important factors to affect a curricular change to include creationism (Deckard, 1996, Tenneson, 2001).

Attitudes, Beliefs, and Worldview of School Board Members Regarding Creationism

It is important to determine the attitudes, beliefs, and worldview of board members concerning creationism and evolution because of their influence on the inclusion of creationism in the district science curriculum and policies. Research has noted that religious conservatives are more likely to view public schools negatively in respect to moral and spiritual principles. For this reason, it is essential that religious conservatives are able to gauge the worldviews of school district leaders. Determining the attitudes and beliefs of board members can provide insight on future changes in policy on the creationism issue. Research shows that religious conservatives and frequent church attendees are more likely to support creationism and other Christian principles (Deckman, 1999, 2002; Woodrum & Hoban, 1992).

Surveys of school board members on religious and political issues have shed light on philosophic and religious trends. The National School Boards Association surveyed conservatives and 28% were identified as political liberals. The survey categorized 54% as religious conservatives and 36% religious liberals. However, it was noted that self-professed conservatives did not necessarily support right-wing educational goals such as vouchers for church schools and private school or tuition tax credit plans. Additionally, less than 1/3 stated that they would support an amendment requiring school prayer (School board members are conservative, 1997).

Religious conservatives do not necessarily support all Christian curricular platforms (School board members are conservative, 1997). Generally though, frequent church attendees and those with conservative religious beliefs tend to be more likely to support creationism in district science curricula (Deckman, 1999, 2002; Woodrum & Hoban, 1992).

Belief in Creationism and Worldview

The central belief of the creationist worldview is that God is the creator of the heavens and the earth. The Biblical accounts of creation, the Great Flood, and the deity of Jesus Christ are a matter of faith for creationists. Yet, the current onslaught of New Age thinking and evolution has challenged creationist worldview (Deckard, 1997).

Christians need to realize that Darwinism is a worldview. Therefore, by accepting any component of evolution, Christians weaken the Christian worldview. It is necessary for creation scientists to impress upon Christians that the belief in a six-day creation affects one's worldview and includes geology, ethics, and public policy/legalities, as well as biology (Deckard, 1997).

Researchers at the Institute for Creation Research (ICR), Liberty University, and The Nehemiah Institute have been involved with a continuing investigation of the way attitudes and beliefs form worldview. They have researched the precepts of YEC and anticipated precepts for Creationist-based science education using the Creationist Worldview Test (CWT) and the PEERS test (Deckard, 1994, 1996, 1997, 1998, 2001, 2004; Deckard, Berndt, Filakouridis, Iverson, Dewitt, 2004; Deckard & Sobko 1998).

The creationism/evolution issue includes misunderstandings by parties on both sides of the controversy Deckard (1994, 1996, 1997, 1998, 2001, 2004). Deckard (2004) has noted that many non-Christians have suggested that Young-Earth Creationists embrace many superstitious and false believe systems, such as animism. To investigate this claim concerning superstitious beliefs, Deckard created a survey. His survey delved into some of the following points: belief in the Bible and YEC, the importance of Christ and church membership to the subject, and belief in evolution.

Deckard constructed a survey to investigate the connection between an individual's belief in creation science to a belief in animism. Deckard's survey consisted of 22 items plus demographic questions. He sampled the staff at the Institute for Creation Science (ICR), recognizing their bias toward creationism. Clearly, to sample belief systems which include creationism, a biased population is necessary. The results of this study indicated that those who believe in YEC do not believe in animism. Additionally, an insignificant level of superstitious beliefs was found among YEC believers. Deckard's research also helped to clarify and identify beliefs of YEC. Creationism opponents need to understand the YEC beliefs and worldviews in order to fairly consider the inclusion of creationism in the science curriculum (Deckard, 2004).

When explaining the existence of life on earth, there are two worldviews: evolution or creationism. Life either was created fully formed by a creator or it "evolved" from life forms which were modified in some way. Though evolution is not a reliable predictor of natural occurrences in organisms, many scientists have elevated it to a god-like status (Deckard, 1996).

Though it is assumed by many that evolution is fact and belief in creationism is based on faith, both evolution and creationism require faith. Creationism is based on faith in the book of Genesis and the Holy Scriptures. Evolution is based on ideas and theories devised by humans which are unproven. Therefore, both creationism and evolution require faith; neither can be proven (Deckard, 1996).

Creationists are involved in war against the widely accepted evolutionary theory proposed by Darwin. Creationism and evolution are the opposite ends of the

origins belief continuum. Evolution, though unproven, has gained acceptance because the alternative, creationism, is clearly incredible to many. By rejecting creationism, one has only one alternative theory remaining regarding the origins of life: evolution (Deckard & Soboko, 1998).

Fundamentalist Christians have fought evolution from the beginning. Between 1921 and 1929, proposed anti-evolution bills were presented to twenty-one state legislatures, of which five were passed into law. This movement continues today and is supported by lobbying efforts. Concerning schools, there also have been efforts to recruit and train fundamentalists to run for positions on the local school board. Creationists must be challenge the evolution worldview (Combs, n.d.; Deckman, 1999, 2001; Gold, 2004, Herrnson, Paul, 1995; Seligman, King, M., Kim, C., & Smith, R., 1974; Simonds, n.d., 1985).

Evolution as a Worldview

According to evolutionists, teachers who provide instruction in evolution should stress its advantages and scientific merit which will produce students who are better science reasoners. Also, they feel that student religious beliefs should not be addressed in science class because they are out of the realm of science. Evolutionists assert that evolutionary theory is the cornerstone for modern science and is supported by most biologists according to (American, 1993; National, 1998; NSTA, n.d.; Wisconsin board, 2004; Zimmerman 1987). Therefore, high school and college biology curricula and texts are based on this premise (Tenneson, 2001).

Evolutionary theory is based on the amalgamation of inductive and deductive

reasoning; this scientific method was utilized by Charles Darwin in devising the theory of evolution. Scientists have little doubt concerning the fact that natural selection occurs and works successfully. However, whether natural selection actually leads to the production of new species is a matter of debate within the scientific community. The classic example of the Peppered Moth's survival on clean or polluted environments illustrates natural selection. Yet, scientists have been unable to demonstrate that new life has been created via natural selection. Fossil records do not support evolution, as purported by Darwin. There are several organisms that are in the same form today as they were millions of years ago. While evolutionists note the stasis of these forms (corals and jellyfish from the Cambrian period, for example), they have been unable to reconcile this discrepancy. Actually, this stasis tends to support the creationist worldview because the lack of change tends to negate the theory of evolution (Deckard, 1996).

Darwin had his own agenda. He asserted that since natural selection accounted for life in its current form, no supernatural creator was needed in the evolutionary process. Prior to Darwin's theory, conventional thought identified the world as relatively young and that organisms had changed little since their creation. However, biology and other sciences changed dramatically as a result of Darwin's theory of evolution: that the world is constantly evolving, but without a plan by a creator. A Creator God is replaced by the god of evolution. For many, evolution provides order to the universe. It also resulted in a paradigm shift which replaced a God-centered worldview in a Creator God to the theory of evolution for many (Deckard, 1996).

Belief in evolution is not simply a scientific precept; it is a worldview. Evolutionists promote this worldview through education.

Worldview and the Science Curriculum

In secondary science curriculum strategies, the primary instructional method is memorization (Deckard, 1996, Nov. 1). Interpretation, synthesis, and thinking skills are generally not emphasized. The conflict here, aside from poor instruction, is that science is actually a set of concepts which must be incorporated into one's worldview. Additionally, knowledge, especially in the field of science, is not stagnant; it changes as new knowledge is uncovered. For this reason, establishing a worldview is critical in the face of a fluid knowledge base and can affect a student's interest in the science. Therefore, science instruction should provide opportunities for investigation, application, and the development of thinking skills which will lead to the development of a worldview and should include creationism (Deckard, 1992, 1994, June 1996, Oct. 1997, 1998, Dec. 1998, May 2002; Deckard & Soboko, 1998).

Deckard and Soboko (1998) have considered the effect of instruction on students' belief systems. To complicate matters, 90% of the secondary teachers use textbooks 95% of the time for instruction (Deckard, Aug. 1996, Nov. 1996, Oct. 1997, 1998; Yager, 1983). These textbooks also focus on evolution while serving as the scaffold on which the students build their belief systems. Therefore, the exclusion of creationism from these textbooks has the effect of excluding creationism from the minds of many students. Deckard states that a student must have more than an understanding of scientific knowledge to develop a worldview; the student must also consider sources of knowledge outside of science. Deckard and Soboko assert that only a creationist belief system will result in the development of a truthful and accurate worldview (Deckard & Soboko, 1998).

According to Deckard and Soboko (1998), to counter the challenge presented by evolutionists, a well-thought out, practical, and understandable plan for high school students and teachers is necessary (Deckard & Soboko, 1998). How Christians teach their children science often conflicts with science curricula, textbooks, and instructional practices which focus primarily and in many cases exclusively on evolution (Deckard, 1998).

Georgia science standards do not mention creationism on any grade level. However, they do contain specific standards on evolution: “biological evolution is that the earth’s present-day species developed from earlier, distinctly different species.” (Standards, n.d., p. 3) These standards only provide for instruction in evolutionary theory to the exclusion of creationism. To provide students with an effective and balanced science education, Deckard (1998) has proposed 10 tenets to help support the creation worldview: 1. Worldview development should be a component of science education. 2. The merging of the senses, mind, and spirituality must take place for true science learning to occur. 3. Effective teaching must include the senses, mind, and spirituality. 4. Assessments in science should include facts, the understanding of God’s creations, the development of a student’s worldview, and the student’s abilities of learning which includes the senses, the mind, and spirituality. 5. Biblical concepts of creation should be included in science textbooks. 6. Christian creationist worldview should be taught by competent instructors before evolutionary theory is introduced. 7. Because both creationism and evolutionary theory are belief systems, it is proper for both to be discussed in science classes. 8. Christianity holds that God as the source of all knowledge; science is merely one method of obtaining knowledge of the world. 9. The teaching of creationism should be systematic

and incorporated into textbooks and teaching materials in all science classes. 10. The science educator must understand that spirituality and scientific knowledge can not be separated.

Evolutionary theory is hostile to Christian principles. However, with well-trained creationist instructors and the evidence of creation resources available, Christian teachers should be prepared to have a dramatic affect on students' worldview. In this way students will learn the truth of science (Deckard, Nov. 1996, Oct. 1997, 1998, 2002). Obviously, science teachers must be properly prepared for their job, but many are unqualified. Science education majors are rarely exposed to creationism in college. Instead, they are systematically taught evolution exclusively, along with evidence supporting it. Divergent theories are omitted. For this reason, there is a need for science teachers to be provided with the knowledge and literature needed for creationist instruction. The Institute for Creation Research and Creation Education Resources are attempting to provide these services. Yet, it is clear that most science teachers do not support creationism in science instruction according to (Combs, n.d.; Deckard, 1997; Simonds, 1985; Understanding, n.d.). To include creationism in the written school curriculum is often a red flag inviting lawsuits for failure to separate church and state (Matsumura, 2001; Mirsky, 2006; Slevin; 2005; Taibbi, 2005; Toland, 2005).

According to Deckard (1997), most science teachers support theories which conflict with the Biblical account of creation. The evidence for this statement can be found in textbooks, along with media news account supporting evolution. The Institute for Creation Research has studied this issue (Deckard, 1997). In addition, science curricula generally exclude creationism.

To include creationism in the curriculum, it is important to have well-trained faculty. Without appropriately trained teachers, effective creationism instruction is not possible. Overman (1977) contrasted a survey of science teachers with a survey by Tatina in 1989; the differences between the results of these studies indicate that biology teachers are likely to receive greater training in evolution than teachers in other disciplines. Furthermore, it is apparent from these studies that these educators have a greater lack of knowledge of creationism than the general public. In general, it appears that science teachers do not understand that creationism and evolution are diametrically opposed. The fact that evolution is not universally taught in biology classes implies that it is not supported universally by all biology instructors. In fact, Overman asserts that more science teachers believe in creationism than evolution (Deckard, 1997; Overman, 1997).

Curriculum: Paradigm Changes in Education, Evolution, and

New Age Thought versus Christianity

New Age thinking, Global Education, and evolution theory have had dramatic impacts on public worldview. In education, Global Education, for example, encompasses such topics as multicultural education and international curriculum (Deckard, 1992).

According to Deckard (1992), the following support Global Education: the National Association of State Boards of Education, the National Education Association, the National School Boards Association, the National Association of Elementary School Board Principals, the American Association of School Administrators, and the national Parent-Teacher Association. Global Education promotes: cultural relativism; a de-emphasis of Christianity, eastern culture, and nationalism; curricular materials that use

guided imagery as a strategy; and meditation (Clark, & Geisler, 1990; Deckard, 1992; Slick, 2006; Wise, 1995). The prestigious reputation of many of these supporting organizations adds to the credibility of Global Education.

Pseudo-sciences, according to Preece and Baxter (2000), which are popularized in the media and promoted by well-organized groups, should be a source of anxiety for science educators. Preece and Baxter include astrology, feng shui, and creationism in under the label of pseudo-sciences. Dick Sutphen, a prominent New Age thinker, asserts that the exterior and inner consciousness are the same and that because of this we are all God; knowledge of a person's inner self results ultimately in mastery of one's reality.

New Age thought purports to afford peace and cultural harmony nationally as well as internationally (Clark, & Geisler, 1990; Deckard, 1992; Slick, 2006; Wise, 1995). New Age thinking and Eastern religions, under girded by evolutionism, have become more acceptable with the general American public. Evolution has provided structure and order to science and even to human behavior; now, man creates the rules, the world. There is no need to justify behavior or look beyond one's own power. This has turned into a cultural evolution which replaces Christian ethics with ethics created by man (Deckard, 1992).

According to Deckard (1992), New Age thinking has created a dramatic change in education, not only in science, but across the curriculum:

This type of thinking clearly rules out the God of creation who spoke the world into existence by His own power. Thus New Age teaching and the new modern science of geophysiology are incompatible with the Bible.

This is because of the evolutionary, humanist, and Eastern Mysticism

roots of the New Age and Global Education Movements. These false philosophies are nothing more than Satan's "Old Lie" (the idea that man is equal to God). This lie is incapable of leading a person to a comprehension of the God of the Bible as the Creator and Sustainer of life, and is thus a philosophy which is itself devoid of life (Deckard, 1992, para. 15).

It is clear that further scientific creation research such as radioisotopes and the age of the earth is critical. Such additional research will provide a scientific backdrop to support the YEC position (Deckard, et al., 2004). Providing scientific evidence for the YEC position will distance it from pseudo-sciences such as astrology.

Review of Methodology of Surveying Local School Board Members and Students on the Creationism/Evolution Issue

Few studies were found on the surveying of school board members on the creationism/evolution science curricular issue. Therefore, the research of study methodology includes surveys on curricular issues and attitudes toward creationism and other Christian principles. It also includes studies which cover topics tangential to this study which contain information useful in formulating the methodology for this study.

National Survey of Candidates for Local School Boards

In Deckman's research (1999, 2002), the impact of religious beliefs on attitudes on the following targeted school issues was studied in a 1998 mail survey of board member candidates: creationism, school prayer, and vouchers along with two case studies. Her self-created national survey instrument was disseminated to a random sampling of 300 (out of about 15,000 boards nationwide, from 39 states) school boards,

including 147 small, 137 medium, and 16 large districts. Her study highlighted religious variables which motivated citizens to participate in politics (Deckman 2002).

Deckman (1999, 2000) used regression analysis to study how religious views affected support of creationism. After reviewing the results, it was noted that conservative Christians are more likely than mainstream Protestants to take actions supporting the targeted issues. Her study found that members of the Christian Right are more likely than non-members to make a decision to become a school board candidate due to their religious convictions. In fact, it was found that the support of the group consciousness, the backing of organized religiously-oriented special interest groups such as the Christian Coalition, and personal benefits from following religious convictions provide needed encouragement and support required to meet the challenges of running for office and promoting the Christian Right platform once elected.

It was noted that being an evangelical Christian and frequent church attendee were two factors that increased one's likelihood of supporting creationism in the curriculum, school prayer, and the voucher system. Those with non-Judeo-Christian worldviews had much lower levels of support for creationism and school prayer. However, the largest predictor of support for the targeted issues of creationism, school prayer, and vouchers was conservative political philosophies (Deckman, 1999, 2002).

Considering the demographics of Deckman's (1999) dissertation study, it was found that generally, candidates for school board were well educated, most having college degrees. They also generally had good family incomes ranging from \$40,000 per

year to \$80,000 year. She also noted that members of the Christian Right were more likely found in rural and urban areas than suburban areas (Deckman, 1999).

The decisions made by the local school board members concerning the creationism/evolution curricular issue can impact the attitudes, beliefs, and worldviews of students in the district.

Attitudes/Beliefs of High School Students Regarding the Creationism Issue

Measuring Changes in Attitudes/Beliefs after Creationism Instruction

Researching worldview is a complicated endeavor. Deckard and Soboko (1998) created an instrument which used a Likert scale to measure attitudes and beliefs concerning the creationism/evolution issue. Students in private Christian schools, church schools, and home schools were studied utilizing the same instrument as a pre- and post-test. Students were taught in numerous sessions by instructors from the Institute for Creation Research. It was noted that improvements in the score in the post-test could be in part attributed to the effects of the pre-test. However, it is clear that instruction in creationism has a significant effect on changing a secondary student's worldview. This study used predominantly white, middle class subjects. It was recommended by the researchers that the study be replicated with diverse subjects.

Survey of Attitudes/Beliefs on Creationism Issue

Ray studied creationist and evolution worldviews in four groups of students in Atlanta: Christian school groups, church youth groups, a public school class, and a home school group. As a result of the study of high school students' attitudes toward creationism and evolution, it was found that many high school students believe in a

creator God and are born-again Christians, which form the core of their worldview. (Deckard, 2002).

Ray used two survey instruments. The first was the Creationist Worldview Test (CWT), a 51-item survey, created by Deckard (1997; 2002) to measure views on the creation/evolution issue. The second was the PEERS Test, a 70 item instrument designed to measure Christian views in politics, economics, religion, and social issues created by Smithwich of the Nehemiah Institute in 1995 (Deckard, Aug. 3, 1998; Dec. 1, 1998; 2002).

The results of this study were surprising. Despite the fact that most respondents indicated that they were born-again Christians, 39% were categorized as secular humanists and 28% as socialists. Yet, there was still a strong relationship between creationist beliefs and their attitudes toward education. No student with atheistic views was categorized as Biblical Theists or moderate Christians. Not surprisingly, those categorized as creationists believed in a creator God while those categorized as evolutionists did not (Deckard, 2002).

Among the four groups studied, home school students were found to have stronger beliefs in Christian precepts on both instruments while public school students scored the lowest. This research indicates that public schools do not promote strong Christian worldviews in their students. It is clear from this study that the Christian community must support a Biblical account of creation. Children must be taught evolutionary thinking, especially when creationism is not taught in schools (Deckard, 2002).

Assessment Instrument of College Biology Students Regarding the Creationism Issue

Tenneson (2001) developed an instrument on creationism/evolution to be used as a pre- and post-test to be used by college biology teachers to assess scientific attitudes and beliefs on the evolution/creationism issue. The finished instrument could be used as an evaluative tool measuring the success of classroom creationism instruction. This information could be used to increase students' understanding of scientific method applied to the evolution/creationism issue.

A 5-point Likert scale was used for questions 9-26 in Tenneson's (2001) instrument, while questions 1-8 provided demographic information. The questions addressed specific attitudes toward the creationism/evolution issue such as: "14. God is above time, so a 'day' in the Bible doesn't necessarily mean 24 hours...21. Incorrect scientific theories do not gain wide acceptance because the scientific community must be able to replicate the experiment." (pp. 79-81)

Tenneson (2001) took great care to emphasize content and construct validity, but not criterion-related validity. He used the literature review, an expert panel which used a content validity rating form (which was judgmental, dependent on the decisions of the subject experts), and audio-taped responses from 10 randomly selected students on 11 open-ended questions. He used the SPSS program to perform an exploratory factor analysis using principal component analysis.

Tenneson (2001) did not administer his instrument in his dissertation rather he developed it for his dissertation. His conclusions were that his instrument was reliable, valid, and readable by college students. By using this survey as a pre- and a post-test, an instructor can properly evaluate instruction focusing on science thinking skills connected to attitudes and beliefs on this topic.

Because subjects attended the same Christian-based university as Tenneson (2001), he admits that his instrument may have limited applications. Therefore, they are not representative of college biology students nationwide. However, this instrument may prove useful in assessing the effectiveness of classroom creationism instruction on beliefs and attitudes.

The Effect of Creationism Instruction on Attitudes and Beliefs of College Students

Regarding the Creationism Issue

Deckard and Dewitt are involved in a continuing research project to determine if the attendance in an apologetics course or a presentation on creation can affect a change in students' belief systems. In the spring semester of 2002, two apologetics classes were studied at Trinity Bible College. Both classes were administered a pre-test using the Creationist Worldview Test (CWT) which was created by Dr. Deckard in 1997. The CWT consisted of 51 items designed to measure views and attitudes toward creationism and evolution. The CWT was given as a post-test at the conclusion of the apologetics course (Deckard, Berndt, Filakouridis, Iverson, & Dewitt, 2004).

The results of this study at Trinity Bible College demonstrated an increased belief in creationism and other Christian precepts after completion of the apologetics course. The Deckard/Dewitt study highlighted deficiencies in previous science instruction in aspects of YEC. A creationist worldview was strengthened as a result of college instruction based on the YEC perspective. The primary science educational focus on evolution necessitates clear instruction in creationism. Without creationism instruction, there will be a tendency to drift from the Christian faith. This study

stresses the connection between instruction and worldview. It also serves to support Christian educators' efforts to include a YEC apologetics course in the school curriculum (Deckard, 1997; Deckard, et al., 2004). Additionally, it focuses on the importance of churches and families to provide a strong Bible-based background.

Review of Survey Methodology

Phone Survey Regarding School Prayer

A study analyzing the support of creationism among the general population was conducted by Woodrum and Hoban (1992). The researchers used a phone survey to identify a relationship between belief systems which included the Biblical account of creation and the support of school prayer. The relationship found by Woodrum and Hoban was a positive one (Woodrum and Hoban, 1992). However, phone numbers are not always available when surveying a specific population.

This survey methodology indicates that problems can occur in surveying select subjects by telephone when those numbers are unavailable to researchers. Alternate dissemination methods should be considered.

Internet and Mixed-Mode Surveys

Different modes of survey data collection often produce different results (Dillman, 2000). Often, e-mail surveys are used because they are quick and cost-effective and offer new opportunities of academic research (Orr, 2005). Yet, many people are infrequent e-mail users while others are nonusers. To deal with this dilemma, a tailored mixed-mode method may be employed. The mixed-mode method provides surveys to subjects electronically for those with e-mail addresses and paper questionnaires for those without e-mail addresses. However, as the public increasingly screens phone calls and e-mail,

obtaining responses for this survey dissemination method may be problematic (Dillman, 2000).

Mixed-mode surveys can provide a balance for weaknesses in each component method. Unfortunately, mixing modes introduces to possibility that answers may vary depending on the mode used. While mixed-mode surveys may or may not affect return rates, response differences between the two modes affect survey validity (Dillman, 2000).

According to McCabe, Boyd, Couper, and D'Arcy (2002), response rates for web-based surveys were much greater than U.S. mail surveys. Though multivariate logistic regression noted response differences based on racial and gender demographics between the two modes, after controlling for design discrepancies, no significant differences between the modes for data quality was identified. It was found that the Web-based surveys resulted in the most representative samples. Therefore, the researchers concluded that Web surveys are a viable survey dissemination mode (McCabe, et al., 2002).

By contrast, the Core Drug and Alcohol survey questionnaire of 750 University of Georgia undergraduates found that the highest response rate was achieved through U.S. mail surveys. The lowest response rate was found in the Internet survey mode. Though females responded at higher rates than males to the electronic survey, no statistic differences were noted between the sexes on the different survey modes (Bason, n.d.).

Another study researched response time, rate, and cost of e-mailed surveys compared to U.S. Mail surveys. Two randomly selected geriatric division chief cohorts were studied. Fifty-seven were surveyed electronically and the same number was surveyed via the postal service. The first contacts for both groups received no response. Two more e-mail invitations were distributed with a 58% response rate. The mailed

survey invitations resulted in a 77% response rate. The response time for e-mailed surveys was 18 days while mailed survey response time was 33 days. The average cost for the electronic surveys was \$7.70 while mailed surveys cost \$10.50 per response. The study concluded that despite lower electronic response rates for this group of subjects, the lower cost, better response time, and satisfactory response rate make electronic surveys a viable choice in survey dissemination (Raziano, Jayadevappa, & Valenzula, 2001).

In another study which analyzed e-mail, U.S. Mail, and web site survey modes for the National Association of Science Writers researching professional science writers' use of e-mail and the Internet, subtle differences in the survey modes were recognized. The researchers did not, however, observe differences which made substantive differences in the data analysis. In fact, the identifiable differences actually resulted in improved sample representativeness using this multi-mode technique without contributing to result bias (Yun, G. W., Yun, G., & Trumbo, C., 2000).

Cole, Bedeian, and Field (2006) conducted a mixed-mode, 20-question survey of 4,909 employees of a multinational organization to study the equity of identical Internet-based surveys and paper-and-pencil surveys. Their research found that if surveys are sound ones, there is little difference between Internet surveys and paper-and-pencil ones. Another mixed-mode study was completed for collecting sensitive data on alcohol and other drugs using the Internet and the U.S. Mail for survey dissemination. In this study of 7,000 randomly selected undergraduates at a large Midwestern research university in 2001, the response rate for the Internet surveys was significantly greater than mailed surveys. Additionally, no significant differences were noted between the two modes of survey dissemination after controlling for design discrepancies. The study conclusions

found web-based surveys to be effective at collecting sensitive personal data when the target population uses the Internet frequently (Cole, et al., 2006). The conclusions of Cole, Bedeian, and Field will not necessarily transfer to this study. While this dissertation study on the creationism/evolution science curriculum issue is also sensitive data, the levels of technological use of school board members may not match the technological skill of college students nor may school board members be willing to trust the anonymity assurances when some districts monitor Internet usage.

Another study researched response time, rate, and cost of e-mailed surveys compared to U.S. Mail surveys. Two randomly selected geriatric division chief cohorts were studied. Fifty-seven were surveyed electronically and the same number was surveyed via the postal service. The first contacts for both groups received no response. Two more e-mail invitations were distributed with a 58% response rate. The mailed survey invitations resulted in a 77% response rate. The response time for e-mailed surveys was 18 days while mailed survey response time was 33 days. The average cost for the electronic surveys was \$7.70 while mailed surveys cost \$10.50 per response. The conclusion of the study was that despite lower electronic response rates for this group of subjects, the lower cost, better response time, and satisfactory response rate make electronic surveys a viable choice in survey dissemination (Raziano, Jayadevappa, & Valenzula, 2001).

When selecting survey dissemination methods, several factors are critical. The expected response rates, costs, and time efficiency are vital considerations. If timely return rates and low cost is important, expected response rates should be determined to make an wise choice of dissemination methods (Bason, n.d.; Cole, et al.; Dillman, 2000;

McCabe, et al., 2002; Orr, 2005). However, when surveying subjects with unknown Internet access or skill on topics of sensitive issues, U.S. Mail disseminations may be the best choice.

Summary of Survey Methodology

When considering survey dissemination modes, many factors must be considered. Most researchers did not note significant statistical variance between the various modes in multi-mode survey dissemination. However, most researchers found that U.S. Mail surveys resulted in the highest return rates. (Cole, 2006; Dillman, 2000; McCabe, 2002; Miller, 2000; Orr, 2005; Razioano, 2001; Yun, et al., 2000). Therefore, despite the increased survey cost and decreased time efficiency, the mail survey dissemination mode was selected for this study.

CHAPTER III

METHOD

The General Perspective

In this quantitative study, surveys were disseminated between October 30 and November 27, 2006. 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. If the probability associated with the result was equal to or less than $\alpha=.05$, the relationship or difference was accepted as significant. Chi Square Test of Independence as used to examine the degree of the relationship between subjects' beliefs and district location (rural, urban, suburban) and the inclusion of creationism in the district science curricula.

Research Context

Georgia local public school board members were studied during the fall of 2006 to determine if a relationship exists between district size or subjects' attitudes and beliefs on YEC and OEC and the district's inclusion of creationism in the district's science curriculum. The first contact with subjects was made on October 27, 2006. The survey dissemination began on October 30, 2006 and concluded on December 27, 2006.

Problem Statement

Some local school districts in Georgia have grappled with the issue of creationism in science curricula. In Georgia school districts, it is the responsibility of the local school boards to develop curricula within the parameters of state and federal regulations and legal constraints, including decisions on the inclusion or exclusion of creationism in

district science curricula. The relationship between school board members' attitudes and beliefs on the creationism/evolution issue and the inclusion or exclusion of creationism in the district science curriculum was not known. Also, whether the relationship between the subjects' beliefs and attitudes and the inclusion or exclusion of creationism in the district science curriculum varies by school district size has not been identified.

Research Questions and Hypotheses

Research Question 1

Research Question 1 asked "What is the relationship between school board members' personally held beliefs 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_{01} : 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_{02} : 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_{03} : 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_{04} : 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.

Research Question 2

Research Question 2 asked "Is school district location (rural, suburban, and urban) associated with the permitted inclusion of creationism in the school district science

curriculum?”

The following null hypothesis was created based on the third research question:

H_{05} : There is no significant association between school district location (rural, suburban, and urban) and the permitted inclusion of creationism in the school district science curriculum.

Research Question 3

Research Question 3 asked “Is school district location (rural, suburban, and urban) associated with the required inclusion of creationism in the school district science curriculum?”

The following null hypothesis was created based on research question 3:

H_{06} : There is no significant association between school district location (rural, suburban, and urban) and the required inclusion of creationism in the school district science curriculum.

Subjects

One thousand thirty-four Georgia local school board members were identified and a randomized sample of 144 was surveyed.

Local school board members were located through local districts, either through the district websites or by phone. These Georgia public schools board members were selected as survey invitees through the use of a random sampling. All school districts in Georgia were located from the Georgia Department of Education website (School Systems and Superintendents, 1997-2005). Some districts list board members local mailing addresses or district addresses on their district websites. If the district did not list the board members on the website, the district office was contacted by telephone to gain the information.

The Georgia local board member population was identified as 1,034 of which a random sample of 144 was invited to complete the survey. The random selection of board members was made by cutting the names off of the printed list and placing them in a box for random selection. Increasingly, mixed-mode surveys are being used because of time and cost efficiency. Although mailed surveys generally have a slightly higher return rate, According to the literature review, the return rate difference between mailed and e-mailed surveys is not equal which made mail surveys as a preferred choice in survey dissemination (Cole, 2006; Dillman, 2000; McCable, 2002; Miller, 2000; Orr, 2005; Razioano, 2001; Yun, et al., 2000). However, due to the low return rate of electronic surveys, they were not included in this study.

Survey Procedure

Deckman (1999) used a one-month minimum interval between survey disseminations and a two-week interval for reminders. Deckman's method was not utilized for this study because of the concern that the long lapse time between contacts may result in forgotten or misplaced surveys. Instead, Dillman's (2000) survey methods were utilized due to the clear, detailed procedures and appropriate dissemination methods.

Survey Dissemination

According to Dillman (2000), a five-contact survey dissemination method yields the highest response rate. Dillman's recommended method was utilized. The following paragraphs specify this research's adaptation of Dillman's five-contact survey procedure. Dillman indicated that the actual survey dissemination be at two-week intervals with reminders being sent two days after the first survey. These procedures include: a

preletter; a first survey and a second survey invitation with return envelope, a cover letter, and an anonymous return postcard; a reminder postcard; and a final survey invitation with the survey, cover letter, and return envelope (Dillman, 2000). All surveys were hand addressed so that they would not be confused with junk mail. Stamps were placed on all return envelopes and return postcards.

With this study, an important consideration was to maximize the return rate. Dillman (2000) stresses the fact that each contact should be visually diverse so that each contact appears new or different. The first and second contacts were sent in legal envelopes; the first contact was a preletter explaining the study, and the second contact was the first survey invitation. Sending the first two contacts in the same type of envelope was important because they were mailed two days apart. The third contact was a bright yellow postcard. The fourth and fifth contacts were sent in varied colors of greeting card envelopes, all of which were donated. Dillman (2000) recommends sending the fifth contact to non-responders via registered mail. This strategy was not used due to the enormous additional cost for 104 invitees. As an alternative, the final contact can be made by telephone according to Dillman (2000). However, this survey is sensitive in nature and requires anonymity. Additionally, phone numbers were not available for all board members receiving mailed surveys. Anonymity issues and the lack of available phone numbers for all subjects would have made this an unacceptable choice.

All contact with subjects in this study was made via the U.S. Mail. The preletter (the first contact) is located in Appendix A. These preletters were sent to invitees on October 27, 2006. As recommended by Dillman (2000), the preletters were mailed in white legal envelopes.

The second contact included the survey (see Appendix B); a cover letter (see Appendix C); a stamped, return envelope; and a stamped, anonymous return postcard (see Appendix D). The respondents returned the anonymous return postcard separately from the survey. The identifying number (insuring anonymity) facilitated the respondent's name from the list of non-responders in the second contact. This second contact was the first survey dissemination and was sent to all invitees on October 30, 2006.

A Thank You Reminder Card (the third contact) was mailed to invitees on November 1, 2006, two days after the surveys are disseminated. This Thank You Reminder Card (see Appendix E) postcard was printed on a yellow cardstock. Dillman (2000) recommended using a postcard format so that this contact differs visually from the legal envelope in contacts one and two.

The fourth contact, the second survey invitation, was disseminated on November 13, 2006. The second survey dissemination included the survey; a cover letter (see Appendix F); a return (stamped) envelope; and a stamped, numbered postcard for anonymity (Appendix D). This second mailed survey invitation was sent to all non-responding board members. The actual mailed survey had a yellow color-code mark in the lower right corner to identify it as the second survey for the researcher. Following Dillman's (2000) assertion that subsequent contacts containing the survey material should not all appear the same, varied colored greeting card envelopes were used for the second survey dissemination. Again, all were hand addressed.

Final survey invitations were sent to all invitees on November 27, 2006. Final mailed survey invitation included a survey; a cover letter (Appendix G); and a stamped, return envelope. With this mailing, the Anonymous Postcard was not included because

the purpose of this postcard was the removal of the respondents' names from the mailing list; this was the last survey dissemination, so the postcard was deemed unnecessary. Final surveys were identical to the previous two disseminations, but a pink color-code mark in the lower right corner was used to identify it as the final survey invitation for the researcher. Again, hand-addressed greeting card envelopes were used for the final survey dissemination. This survey dissemination procedure follows Dillman's recommendations (Dillman, 2000).

Random Selection of Subjects

Three randomly selected school board members no longer held their positions and were replaced with other random selections. Other problems were experienced also. For example, one district office returned one board member's third survey invitation with a note. The note explained that the district had forwarded the board members two previous survey invitations but that he was no longer on the board. A replacement for this member was not made because he could have answered one of the other surveys without returning the anonymous postcard (more returned surveys had been received than anonymous postcards). It is unknown how many surveys did not reach their intended invitee. In another case, the district office had moved to a new physical location, and the surveys for two board members were returned. However, the board's new address was located, and the surveys were resent.

One subject returned the third survey invitation on December 7, 2006. He included a signed note stating,

Ms [sic] Cook, I did return the first survey to you..And [sic] then when I rec'd the 2nd survey I thought that you just made a mistake—then I rec'd the 3rd!! Sorry for

the delay it has caused you in your studies. Best Regards. (Anonymous survey, 2006).

An anonymous return postcard was not received from this subject from the first survey invitation. Therefore, his second survey submission was included in data analysis because it was assumed that his first survey submission had not been received.

Obviously, there it is the possibility that some board members did not receive their mail at the county office. However, considering few districts returned the surveys, it is likely that the board member received them by the time the survey ended.

Instrument

A survey was created to test the hypotheses (Appendix A) which was disseminated to board members. The survey measured the connection between the beliefs/attitudes of board members and district location with the inclusion or exclusion of creationism. The surveys were field tested for reliability, readability, and consistency.

Review of Surveys

Several surveys were considered for potential use. It would have been easier to select a tested and validated survey. These surveys were considered: Deckman (1999), Tenneson (2001), Deckard (CWT, 1998). However, none of these surveys directly and succinctly addressed the questions being researched. Deckman's survey was intended for candidates for school board, but it included of political questions. Tenneson's survey was designed as pre- and post-tests for high school students, and Deckard's survey was intended as pre- and post-tests for college students through adults. Additionally, each survey was lengthy. According to Dillman (2000), surveys have a higher response rate when brief. When surveys are given to high school and college students during class (a

somewhat captive audience), the return rate is likely to be much higher than a controversial survey mailed or e-mailed to professionals with varied motivational levels for survey completion.

Modifications of Instrument Based on Field Test

The researcher-constructed instrument was field tested. Five people were selected to complete the field test. 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. Appropriate modifications were made based on the field test results.

Variables

This study has several variables to consider:

Response Variable

- Differences in responses between responders and non-responders.

Variables

- Belief or disbelief in YEC.
- Belief of disbelief in OEC.
- Whether or not the district permits the inclusion of creationism in the science curriculum.
- Whether or not the district requires the inclusion of creationism in the science curriculum.

Personal Characteristics of Subjects

- Subject's description of the school district: suburban, rural, or urban.
- Subject's gender: male or female.

- Subject's age, under 20, 20-29, 30-39, 40-55, or over 55.
- Subject's ethnicity: Caucasian, African American, Hispanic, Asian, or Other.
- Subject's educational level: high school, some college, 4-year degree, educational specialist, or doctorate.

The research design addressed differences in responses among urban, suburban, and rural subjects as reported by subjects. However, the study was unable to address differences between responders and non-responders. Each invitee was contacted five times. The last contact, the final survey dissemination yielded responses from only 13 responses. It is not likely that additional contacts using the same contact methods would have resulted in a greater percentage of responses.

Data Analysis

The raw data was received via U. S. Mail and was then reduced using the SPSS 11.0 program.

A statistical analysis was performed to examine the degree of relationship between subject beliefs/attitudes concerning creationism and curricular decisions on the district level which permit or require the inclusion of creationism in the science curriculum. Additional analysis was performed to examine the degree of relationship between district size and the permitted inclusion of creationism and the required inclusion of creationism in the science curriculum. Chi Square Test of Independence was used as the analysis tool to test the relationship between variables because ordinal data was collected. The relationship or difference was considered significant if the probability connected with the result was equal to or less than $\alpha = .05$. The strength of the significant relationships was tested with Phi.

CHAPTER IV

FINDINGS

This study was conducted to investigate whether the attitudes and beliefs of local school board members and district location (rural, urban, or suburban) were associated with the inclusion or exclusion of creationism in the district science curriculum. Significance testing for the relationship between the board member beliefs in YEC or OEC and district location and the districts' permitted or required inclusion of creationism in the science curriculum was undertaken using Chi-Square Test of Independence. A relationship or difference was accepted as significant if the probability associated with the result was equal to or less than $\alpha = .05$. Phi (Φ) was used to assess the strength of relationships between variables. This chapter presents the results of the data analyses that were used to describe the sample and to test hypotheses formulated for this study.

Description of the Sample

The description of the sample consists of demographic variables on the school board member. The demographic data are presented in tabular and narrative forms.

Response Rate

Surveys were received from 66 school board members for a 45.83% response (see Table 1).

Table 1

Survey Returns by Status

Subjects	Sent (N)	Returned (n)	Percent of total
			returned
School board members	144	66	45.83

Personal Characteristics of School Board Members

Personal data reported by school board members is listed in Table 2. Personal characteristics included (a) age, (b) gender, (c) highest degree, and (d) race/ethnicity. One (1.5%) school board member was under 30 years of age; 7 (10.6%) were 30-39 years of age. Twenty-five (37.9%) school board members were 40-55 years of age and 33 (50%) reported their ages as over 55.

In terms of gender, 16 (24.2%) school board members were females and 50 (75.8%) were males. Of those school board members responding, 8 (12.1%) reported the high school diploma as the highest degree and 20 (30.3%) had some college education. Twenty (30.3%) school board members held a bachelor's degree and 10 (15.2%) held a specialist degree. Eight (12.1%) reported having a doctorate. Seventeen (25.8.0%) school board members described themselves as Black or African American; 1 (1.5%) described himself/herself as Asian; 45 (68.2%), Caucasian; 2 (3%), Hispanic; and 1 (1.5%), Other. See Table 2 for a complete summary of these findings.

Table 2

*Distribution of Personal Characteristics of School Board Members**(table continues)*

Characteristic	Frequency	Percent
Age		
Under 30 years of age	1	1.5
30-39 years of age	7	10.6
40-55 years of age	25	37.9
55+ years of age	33	50.
Total	66	100.0
Gender		
Female	16	24.2
Male	50	75.8
Total	66	100.0
Highest Degree		
High school diploma	8	12.1
Some college	20	30.3
Four-year degree	20	30.3
Educational specialist	10	15.2
Doctorate	8	12.1
Total	66	100.0
Race/Ethnicity		
African American	17	25.8
Asian	1	1.5
Caucasian	45	68.2
Hispanic	2	3

Other	1	1.5
Total	66	100.0

Research Questions and Hypotheses

The results of the analysis used to answer the research questions developed for this study and test their associated hypotheses are presented in this section. All decisions on the statistical significance of the findings were made using an alpha level of .05.

Research Question 1

Research Question 1 asked “What is the relationship between school board members’ personally held beliefs regarding creationism and the inclusion of creationism in the school district science curriculum?”

To address Research Question 1, the following null hypotheses were tested using the Chi-Square Test of Independence:

- H_{01} : 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_{02} : 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_{03} : 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_{04} : 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.

Null hypothesis one. Null hypothesis one states 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. Cross tabulations were performed on the data, and the Chi Square Test of Independence was used to examine the relationship between school board members' Young Earth Creationism beliefs and the permitted inclusion of creationism in the school district science curriculum. Table 3 lists observed frequencies, expected frequencies and totals. Considering the question, "Does your county/district curriculum permit the inclusion of creationism in the science curriculum", thirty-six of the respondents reported that their districts permit the inclusion of creationism (see Table One). Thirteen of the 36 reported a belief in YEC. The Chi-Square (4.835) and Phi (.291) values are significant ($p=.028$) ($p<.05$). Therefore the null is rejected. However, the continuity corrected data is: 3.561 and $p = .059$, which may limit the importance of this finding.

These data indicate a positively significant relationship between Young Earth Creationism beliefs and the permitted inclusion of creationism in the science curriculum; the strength of the relationship was found to be weak. It should be noted here that phi and chi-square coefficients indicate jointly the strength and significance of a relationship.

Table 3

Permitted Inclusion of Creationism in the School District Science Curriculum and School Board Members' Beliefs in Young Earth Creationism

(table continues)

		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. A statistically significant association exists between school board members' Young Earth Creationism beliefs and permitting inclusion in the science curriculum, $\chi^2 (1) = 4.835, p = .028$. Phi (Φ) = .291, $p = .028$.

Null hypothesis two. Null hypothesis two states 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. Cross tabulations were performed on the data, and the Chi Square Test of Independence was used to examine the relationship between school board members' Old Earth Creationism beliefs and the permitted inclusion of creationism in the school district science curriculum. Table 4 lists the observed frequencies, expected frequencies and totals. In districts permitting the inclusion of creationism, fewer than expected school board members who believed in Old Earth Creationism and more than expected school board members who did not believe in Old Earth Creationism responded yes when asked if the school district permitted the inclusion of creationism in the school district science curriculum.

Forty-five of the respondents reported that their districts permit the inclusion of creationism (see Table Four). Twenty-four of the 45 board members in districts requiring the inclusion of creationism reported a belief in OEC. The Chi Square Test of Independence was statistically significant at the .05 level. The computed value of chi-square (6.508) and the observed significance level, .011, indicates there is a significant relationship between the variables. The strength of the relationship was found moderately negative, $\Phi = -.335$, $p = .011$. It should be noted here that phi and chi-square coefficients indicate jointly the strength and significance of a relationship. Therefore, H_{02} was rejected. We can conclude that the school districts' permitted inclusion of creationism in the school district science curriculum is not due to random variation.

Table 4

Permitted 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	12 (8.1)	1 (4.9)	13
	Total	36	22	58

Note. Numbers in parentheses are expected values. A statistically significant association exists between school board members' Old Earth Creationism beliefs and permitting inclusion in the science curriculum, $\chi^2 (1) = 6.508$, $p = .011$. Phi (Φ) = $-.335$, $p = .011$.

Null hypothesis three. Null hypothesis three states 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. Cross tabulations were performed on the data, and the Chi Square Test of Independence was used to examine the relationship between school board members' Young Earth Creationism beliefs and the required inclusion of creationism in the school district science curriculum.

Table 5 lists the observed frequencies, expected frequencies and totals. The Chi Square Test of Independence statistic was not statistically significant at the .05 level. As Table 5 indicates, the computed value of chi-square (1.193) and the observed significance level, .275, indicate there is no relationship between the variables. Therefore, H_03 was accepted. The findings suggest that the required inclusion of creationism in the school district science curriculum may not depend on the Young Earth Creationism beliefs of school board members.

Table 5

Required Inclusion of Creationism in the School District Science Curriculum and School Board Members' Beliefs in Young Earth Creationism

(table continues)

		<u>Belief in Young Earth Creationism</u>		
		Yes	No	Total
Require the inclusion of creationism in science curriculum	Yes	2 (1.1)	2 (2.9)	4
	No	14 (14.9)	42 (41.1)	56
	Total	16	44	60

Note. Numbers in parentheses are expected values. No statistical association exists between school board members' Young Earth Creationism beliefs and requiring inclusion in the science curriculum, $\chi^2 (1) = 1.193, p = .275$.

Null hypothesis four. Null hypothesis four states 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.

Cross tabulations were performed on the data, and the Chi Square Test of Independence was used to examine the relationship between school board members' Old Earth Creationism beliefs and the required inclusion of creationism in the school district science curriculum. Table 6 lists the observed and expected frequencies, and the totals.

Four of the respondents reported that their districts require the inclusion of creationism (see Table Four). The Chi Square Test of Independence was not statistically significant at the .05 level. As Table 6 indicates, the computed value of chi-square (.028) and the observed significance level, .867, indicate there is no relationship between the variables. Therefore, H_{04} was accepted. The findings suggest that the required inclusion of creationism in the school district science curriculum may not depend on school board

members' Old Earth Creationists beliefs. However, there is a lack of sufficient cell numbers to make a valid decision for this hypothesis.

Table 6

Required Inclusion of 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. No statistical association exists between school board members' Old Earth Creationism beliefs and requiring inclusion in the science curriculum, $\chi^2 (1) = .028, p = .857$.

Research Question 2

Research Question 2 asked "Is school district location (rural, suburban, and urban) associated with the permitted inclusion of creationism in the school district science curriculum?"

To address Research Question 3, the following null hypothesis was tested using Chi Square Test of Independence:

H_05 : There is no significant association between school district location (rural, suburban, and urban) and the permitted inclusion of creationism in the school district science curriculum.

Cross tabulations were performed on the data, and Chi Square Test of Independence was used to examine the relationship between school district location (rural, suburban, and urban) and the permitted inclusion of creationism in the school district science curriculum.

The Chi Square Test of Independence was not statistically significant at the .05 level. As Table 7 indicates, the computed value of chi-square (2.088) and the observed significance level, .352, indicate there is no relationship between the variables. Therefore, H_0 was accepted. The findings suggest that the permitted inclusion of creationism in the school district science curriculum may not depend on school district location.

Table 7

Permitted Inclusion of Creationism in the School District Science Curriculum and School Location

		School district location			
		Suburban	Rural	Urban	Total
Permit the inclusion of creationism in science curriculum	Yes	3 (3.9)	34 (32.2)	1 (1.9)	38
	No	3 (2.1)	16 (17.8)	2 (1.1)	21
	Total	6	50	3	59

Note. Numbers in parentheses are expected values. No statistical association exists between school district location and permitting inclusion of creationism in the science curriculum, $\chi^2 (2) = 2.088, p = .352$.

Research Question 3

Research Question 3 asked “Is school district location (rural, suburban, and urban) associated with the required inclusion of creationism in the school district science curriculum?”

To answer Research Question 3, the following null hypothesis was tested using Chi Square Test of Independence:

H_{06} : There is no significant association between school district location (rural, suburban, and urban) and the required inclusion of creationism in the school district science curriculum.

Cross tabulations were performed on the data, and Chi Square Test of Independence was used to examine the relationship between school district location (rural, suburban, and urban) and the required inclusion of creationism in the school district science curriculum.

The Chi Square Test of Independence was not statistically significant at the .05 level. As Table 8 indicates, the computed value of chi-square (2.106) and the observed significance level, .349, indicate there is no relationship between the required inclusion of creationism in the school district science curriculum and school district location. Therefore, H_{06} was accepted. The findings suggest that the required inclusion of creationism in the school district science curriculum may not depend on school district location. However, there is a lack of sufficient cell numbers to make a valid decision for this hypothesis.

Table 8

Required Inclusion of Creationism in the School District Science Curriculum and School Location

		School district location			
		Suburban	Rural	Urban	Total
Require the inclusion of creationism in science curriculum	Yes	1 (.3)	2 (2.6)	0 (.1)	3
	No	5 (5.7)	51 (50.4)	3 (2.9)	59
	Total	6	53	3	62

Note. Numbers in parentheses are expected values. No statistical association exists between school district location and requiring inclusion of creationism in the science curriculum, $\chi^2 (2) = 2.106, p = .349$.

Validation of Instrument

Six potential field testers were identified. Each potential field tester was contacted by phone or e-mail to determine their willingness to participate. One potential tester declined, and the remaining five participated. Field testers were asked to take the survey and report formatting, readability, and logistical deficiencies. The survey was sent to the testers via e-mail and returned to the researcher by e-mail. One tester noted formatting issues which were corrected. Some wording corrections made by another tester were deemed necessary and the appropriate corrections were made. Recommendations by another tester were not accepted by the researcher. Two field testers did not identify any problems with the instrument.

CHAPTER V

DISCUSSION

This final chapter includes a restatement of the research problem as well as a review of the major methodology used to test the formulated hypotheses. Issues and problems with survey dissemination and survey responses are reviewed in this chapter to provide insight into the significance to the data. A summarization of the results and a discussion of their implications are included in sections within this chapter along with recommendations for future studies.

Problem Statement

Some local school districts in Georgia have grappled with the issue of creationism in science curricula. In Georgia school districts, it is the responsibility of local school boards to develop curriculum within the parameters of state and federal regulations and legal constraints, including decisions on the inclusion or exclusion of creationism in district science curricula. The relationship between school board members' attitudes and beliefs on the creationism/evolution issue and the inclusion or exclusion of creationism in the district science curriculum had not been previously identified in Georgia. Also, whether the relationship between the subjects' beliefs and attitudes and the inclusion or exclusion of creationism in the district science curriculum varies by school district size had not been identified.

Review of Methodology

First, the school board population was identified using various websites. When this information was unavailable through websites, districts were called directly for

names and mailing addresses. Then, a sample size of 144 was randomly selected of the total population of 1,034 as survey invitees.

A survey instrument was created and field tested. The instruments were designed to target the problem statement and hypotheses. Appropriate modifications were made to the instruments based on the field test.

Dillman's (2000) five-contact survey dissemination method was utilized. The survey was disseminated at two-week intervals with reminders being sent two days after the first survey. These procedures include: a preletter sent three days prior to the first survey; a first survey (followed 2 days later by a thank-you reminder postcard); a second survey invitation with stamped, return envelopes and a stamped anonymous postcard; and a final invitation with the survey, cover letter, and stamped return envelope. All envelopes were hand addressed so that they would not be confused with junk mail, with various styles of envelopes to peak interest.

The raw data was inputted into SPSS 11.0 for analysis of the formulated hypotheses and the analysis of the distribution of personal characteristics of school board members. Significance testing for the relationship between variables was undertaken using Chi-Square tests. A relationship or difference was considered significant if the probability associated with the result was equal to or less than $\alpha = .05$. The strength of the significance was tested using Phi.

Problems with Survey Dissemination and Subject Responses

The research methodology detailed in Chapter 3 was followed meticulously. The random selection of board members was made by cutting the names off of the printed list and placing them in a box for random selection. The dissemination followed

the detailed procedures, though some problems arose with the dissemination. There were indications of confusion with some survey respondents. The following sections review the dissemination problems, conflicting responses, survey implications, and recommendations for mitigating these problems in future research.

Controlling Multiple Survey Attempts

Several invitees submitted two surveys. These subjects who attempted multiple survey submissions are as follows: 1. One subject returned his first survey rather late. It was received on November 13, 2006, the same date the second survey invitation was mailed. On November 21, 2006, the second survey was received for this subject. The subject was identified by the return postcard which was included in the return envelope along with the completed second survey. It is unclear whether the invitee believed his survey was lost or whether it was simply a second attempt to complete a survey. Fortunately, his second submission was readily identifiable (the return postcard was included with the survey) so that it could be excluded from the data analysis. 2. Another respondent responded twice to the survey. Unfortunately, there was no clear way to identify which survey went with which returned anonymous postcard. Therefore, this multiple survey submission could not be excluded from data analysis. 3. One subject did send a second survey, but he attached a note stating that he had submitted the survey from the first dissemination and then signed the note. It was determined that his first survey had not been received, so the second submission was accepted and included for analysis. 4. A final respondent returned his survey on December 29, 2006 after the survey was closed. This respondent was apparently unsure whether the second survey dissemination he received was an error, Therefore, he also returned the anonymous

postcard in the envelope with the second survey. It was a simple process to determine, with the anonymous postcard, that the survey had been already completed. So this second survey was not included in the survey analysis.

It is possible that more than one subject completed each of the survey disseminations and sent them all after the third dissemination was mailed. There is no way to control for all multiple survey submissions, especially if the anonymous postcards are not received and if the survey and anonymous postcard are not returned together in the same envelope. However, it is doubtful that this type of repeated survey submission happened frequently because there were only two anonymous postcards which were not received from the first two disseminations.

All subjects used the self-addressed, stamped return envelopes. Other crucial reasons to provide these envelopes, aside from increasing the return rates, were discovered. Using different colored or stylized return envelopes and surveys helped to identify which dissemination was returned and whether multiple surveys were answered. Additionally, the stamped envelope discourages subjects from Xeroxing the survey and submitting unlimited numbers of completed surveys. If respondents had used their own envelopes, the surveys would have excluded the surveys from analysis. No subject used their own envelope.

Receipt of Board Member Surveys

Because surveys were not sent registered mail, there is no guarantee that the board member received the survey. Three districts returned board mailed surveys, stating that the individual was no longer on the board (these invitees were replaced with another randomly selected board member). Two surveys were returned by the postal service

because the school board had moved (the correct address and resent the surveys).

However, on December 15, 2006, one board member returned the first survey (which was mailed on October 29, 2006; the subject wrote “Received 12/12/06 Mailed 12/13/06” in the corner of the survey. This indicates that some board members may not have received the surveys mailed to the board office for long periods after the mail arrived at the county office. No mailed surveys were received after the survey was concluded.

Response Rates by Survey Dissemination

The following chart specifies the percentages of response and actual subject numbers by dissemination along with dates of dissemination and receipt.

SURVEYS	Dissemination 1 10/30/06 Response #/ % last receipt date	Dissemination 2 11/13/06 Response #/ % last receipt date	Dissemination 3 11/27/06 Response #/ % last receipt date	TOTAL Responses/ Percent
Board-Mailed N=144	43/29.86% 12/16	10/6.94% 12/18	13/9.29% 12/18	66/45.83%

School Board Members: Contradictory, Omitted, or Confusing Responses

Out of 144 school board member survey invitees, 66 invitees responded. Several of those subjects’ responses had omissions or their responses appeared to be conflicting. Several even responded with question marks. The surveys of these respondents may affect the validity of the analysis results.

First Survey Dissemination

The first survey dissemination was October 30, 2006. The last survey from this dissemination was received on December 16, 2006. By that date, 43 surveys had been returned from the first dissemination. This is a 29.86% return

rate. The following surveys from this dissemination contained contradictory, omitted, or confused responses:

- One board member answered questions 7 (permits the inclusion of creationism) and 8 (requires creationism) with a question mark. It can be assumed that she did not know if her district permitted or required the inclusion of creationism in the science curriculum. She also answered “Yes” for questions 1 (creator God), 4 (evolution), and 12 (vote to exclude creationism) which indicates that she believes that God created the earth and evolution but not in YEC, and she would vote to exclude creationism. She also left question 3 on OEC blank. Demographics include: rural, female, over 55, African American, and four-year degree.
- A male answered “Yes” for questions 1 (creator god), 3 (OEC), and 6 (microevolution). However, he answered questions 10 (vote to include creationism) and 12 (vote to exclude creationism) with question marks, suggesting that he is currently undecided on whether or not he would vote to include or to exclude creationism from the district science curriculum. Demographics include: rural, male, over 55, Caucasian, and Educational Specialist.
- Another board member answered “No” to questions 2 (YEC), 5 (macroevolution), and 6 (microevolution) and “Yes” to all other questions. He answered that he believed in OEC and evolution but that he did not believe in YEC, macroevolution, and microevolution. Though Old Earth Creationists may believe in evolution, they would likely believe in either macroevolution or microevolution or both. Perhaps this respondent did not understand the definitions provided. This

responder's demographic information is: suburban, male, over 55, Caucasian, and high school.

- A board member answered “Yes” for questions 9 (action to support creationism), 10 (vote to include creationism), and 12 (vote to exclude creationism). This means that he has taken action to include creationism in the district science curriculum and would vote to support it, yet he also indicated that he would vote to exclude creationism from the science curriculum which are conflicting statements. The only questions he answered “No” for were questions 6 (microevolution) and 11 (action to exclude creationism). His demographic data included: no response for district size, male, 30-39, African American, and some college.
- Another survey subjects responded “Yes” for questions 1 (creator God), 3 (OEC), 4 (evolution), 10 (vote to include creationism), 11 (action to exclude creationism), and 12 (vote to exclude creationism). Again, questions 10 and 12 are contradictory responses; she responded that she has taken action to exclude creationism in the district science curriculum and that she would vote to include and to exclude creationism from the district science curriculum. Was her response to question 10 an error or was she confused? The demographic information for this subject is as follows: rural, female, 40-55, African American, and Educational Specialist.
- One respondent left questions 5 (macroevolution) and 6 (microevolution) blank, which can possibly mean the respondent is experiencing confusion on the issue, inadequate definitions, or a simple omission. He also answered “Yes” indicating that he believes God created the heavens and the earth, that he believes in OEC,

and that he would vote for the inclusion of creationism. His demographics are: rural, male, over 55, African American, and high school.

- Another survey subject was apparently unsure about questions 2 (YEC) and 3 (OEC) because he placed “?” in the spaces for “Yes” and “No” for those questions. Though he answered “Yes” for evolution and microevolution, he also responded that he would vote to include creationism in the district science curriculum. His answer concerning planned voting stance suggests that perhaps he was either undecided or confused about questions 2 and 3. Perhaps the definitions provided were not adequate, or perhaps the respondent was unsure of his own beliefs. Demographic for this respondent include: rural, male, over 55, Caucasian, and High School.
- Similarly, another respondent did not answer questions 2 (YEC) or 3 (OEC). He wrote “In the Begining [sic]” in the spaces provided for “Yes” and “No” for both questions. This respondent indicated that he does not believe in evolution or macroevolution. However, he did respond that he believes in microevolution and that he would vote to include creationism in the science curriculum. From this subject’s answer, it is unclear whether the respondent understood the definitions for questions 2 and 3. Demographics include: rural, male, 40-55, Caucasian, and Some College.
- Possible confusion may be responsible for another unanswered question from a respondent. He answered “Yes” for 1 (creator God), 3 (OEC), 4 (evolution), 6 (microevolution), 9 (action supporting creationism), and 10 (intent to vote for creationism). However, he left 2 (YEC) blank. Again, whether the definition was

inadequate or whether the subject has not clarified his own beliefs on this topic is unclear. This respondent underlined the word “changes” in the definition of question 4; it is unclear if this underlining has any particular significance. Also, questions 7-9 were answered in different ink from the rest of the questions. Perhaps this was so he could research questions 8 (district permits creationism in the curriculum) and 9 (district requires creationism in the curriculum). However, he also answered question 9 (whether or not he has taken action to support the inclusion of creationism in the curriculum) in the same ink he used for questions 7 and 8. His demographics include: male, 40-55, Caucasian, and High School. This subject did not answer question 13 concerning his identification of his district as suburban, rural, or urban.

- Another subject wrote in “not sure” for both questions 10 (intent to vote for creationism) and 12 (intent to vote against creationism in the curriculum). Clearly, she is undecided on this issue. She also answered “Yes” for questions 1 (creator God), 3 (OEC), 4 (evolution), 5 (macroevolution), and 6 (microevolution). This subject’s demographic data is: rural, female, over 55, African American, and Educational Specialist.
- Again, questions 2 (YEC) and 3 (OEC) were concerns for this respondent. He had problems answering these questions. He placed a check on the line separating “Yes” and “No” for both questions 2 and 3; no answers were given to 2 and 3. He also responded that he believes in a creator God, that he has taken action to support creationism in the science curriculum, and that he would vote to include

creationism in the curriculum. The demographics for this respondent was as follows: rural, male, over 55, Caucasian, and Doctorate.

- A female respondent placed “?” marks in the spaces for “Yes” and “No” for both questions 2 (YEC) and 3 (OEC). Yet, she also answered “Yes” to questions 4 (evolution), 5 (macroevolution), and 10 (would vote to include creationism). She answered “No” to question 6 (microevolution). Additionally, she place “?” marks in the blanks for “Yes” and “No” for questions 7 (district permits creationism) and 8 (district requires creationism). Her demographic data was as follows: suburban, female, 30-39, Caucasian, and Some College.
- Question 2 (YEC) was left blank by another respondent while question 3 (OEC), 4 (evolution), and 6 (microevolution) were answered “Yes.” This respondent also indicated that she would vote to include creationism in the science curriculum. She also omitted the answer for question 7(district permits creationism) but answered “No” for question 8 (district requires creationism). The demographic data for this respondent includes: rural, female, over 55, Caucasian, and Masters Degree as a write-in response.
- For questions number 2 (YEC) and 3 (OEC), this subject made no response. Beside each of these questions, he wrote in a star. At the bottom of the page was the same star with this sentence: “God can make anything, so he could make things look millions of years old in a day!” This sentence indicated that the subject did not want to commit to either YEC or OEC; instead, he wrote in his own belief. Additionally, he answered “Yes” to questions 1 (creator God), 4 (evolution), 5 (macroevolution), 6 (microevolution), 7 (district permits

creationism), 9 (has taken action to support creationism), and 10 (would vote for creationism). His demographic data was: rural, male, 40-55, Caucasian, and Some College.

- Another subject answered “Yes” to questions 1 (creator God), 3 (OEC), and 6 (microevolution). She placed a “?” in the space for “Yes” on question 7 (district permits inclusion of creationism). Interestingly, she indicated that she has not taken action to exclude creationism, but she left the spaces for question 12 (vote to exclude creationism) unanswered. Was unanswered question 12 an oversight or an indication of indecision on this topic? There is no way to discern which is correct. The demographics for this respondent are: rural, female, 40-55, Asian, and 4-Year Degree.
- Another respondent to the first survey dissemination left question 1 (creator God) unanswered. She answered “Yes” to questions 2 (YEC), 3 (OEC), 6 (district permits creationism), 7 (district requires creationism), and 10 (would vote for creationism). Perhaps this respondent did not understand the definitions for questions 2 and 3 because they are considered contradictory. Was the omission of question 1 an error or due to misunderstanding on the part of the respondent? Her demographics include: rural, female, over 55, Caucasian, and Educational Specialist.
- A male respondent answered “Yes” to questions 1 (creator God), 3 (OEC), 4 (evolution), 5 (macroevolution), 6 (microevolution), and 7 (district permits creationism). However, he did not answer question 12 (vote to exclude creationism). Instead, he wrote “undecided” next to the answer space. The

demographics for this respondent are: urban, male, over 55, Caucasian, and 4-Year Degree.

Second Survey Dissemination

The second survey was distributed on November 13, 2006. By this time, 25 responses had been received. Out of those responses the following are the ones which showed some confusion or discrepancies. Returned surveys from this second dissemination were received through December 18, 2006.

- A question mark was placed in the “Yes” space for question 3 (OEC) on the survey by this respondent. However, he answered “Yes” for questions 1 (creator God), 2 (YEC), 4 (evolution), 5 (macroevolution), 6 (microevolution), and question 10 (would vote for creationism in the science curriculum). The demographics for this subject include: rural, male, 40-55, Caucasian, and Some College.
- Another unclear survey response was the placement of a “?” in the space for “Yes” for question 3 (OEC). This respondent answered “Yes” for questions 1 (creator God), 2 (YEC), 4 (evolution), 5 (macroevolution), 6 (microevolution), and 10 (would vote to include creationism). Again, whether the definition provided for OEC did not clarify the question for this subject or whether the subject has not clarified his own beliefs is uncertain. However, clearly, OEC and YEC are mutually exclusive. The demographics for this subject are as follows: rural, male, 40-55, Caucasian, and Some College.
- One board member omitted question 10 (would vote to include creationism).

Outside the answer space, he wrote, “? already teaching.” This respondent answered “Yes” for questions 1 (creator God), 2 (YEC), 6 (microevolution), 7 (district permits creationism), and 9 (has taken action to support creationism).

However, he answered ‘No’ to question 8 (district requires creationism).

Apparently, this board member does not feel he has to vote for the inclusion of creationism because it is permitted but not required. He feels the voting is already over. His demographics include: rural, male, 40-55, Caucasians, and Doctorate.

- A female board member omitted questions 7 (permit creationism) and 8 (require creationism). She also placed a “?” outside of the answer space for question 7. Presumably, she did not know whether creationism is permitted or required in the school science curriculum. She also answered “Yes” for questions 1 (creator God) and 3 (OEC). Her demographics are: suburban, female, over 55, and African American. Additionally, she answered High School and Some College for the educational level question.

Final Survey Dissemination

When the date for the final dissemination arrived (November 27, 2006), 48 mailed surveys had been received in all.

- One final dissemination respondent omitted question number 1 (creator God). He also answered “Yes” for questions 3 (OEC), 4 (evolution), 5 (macroevolution), 6 (macroevolution), and 12, (would vote to exclude creationism). There is no indication whether the respondent simply overlooked question number 1 or whether he was unsure of the answer. The following are the demographic

responses for this question: rural, male over 55, Caucasian, and Educational Specialist.

- A female subject answered “Yes” for questions 1 (creator God), 3 (OEC), 5 (microevolution), 6 (macroevolution), and 10 (would vote to include creationism). Additionally, she answered “Yes” for question 4 (evolution), but she wrote in this qualification for that question: “But-do not believe man came from apes.” She also placed a “?” in the space for “Yes” and “No” for question 7 (district permits creationism). It is surprising that someone who responded that she would vote to include creationism in the science curriculum did not know whether the district permits it and did not research it before submitting the survey. Her demographics include: rural, female, 40-55, Caucasian, and Educational Specialist.
- Another male respondent omitted question 6 (microevolution). He answered “No” to the questions on evolution and macroevolution. He also answered “Yes” to questions 1 (creator God), 2 (YEC), 9 (taken action to support creationism), and 10 (would vote for creationism). Therefore, his omission implies that either this subject had not clarified his own views on this question or the definition was unclear. The demographics for this respondent are: suburban, male, 40-55, Caucasian, and 4-Year Degree.
- Three weeks after the final dissemination, one respondent returned a survey with the answer to question 10 (vote for creationism) left blank. Was this omission an error or does it indicate indecision on whether or not she would vote for creationism? This respondent answered “Yes” to questions 1 (creator God), 3 (OEC), 4 (evolution), 5 (macroevolution), and 6 (microevolution). The

demographics for this respondent are as follows: urban, female, over 55, Caucasian, and Some College.

- Another respondent (response received December 14, 2006) answered “Yes” to questions 1 (creator God), 2 (YEC), 3 (OEC), 4 (evolution), 5 (macroevolution), 6 (microevolution), and 10 (would vote for creationism). YEC and OEC are mutually exclusive. It is possible that the subject did not understand the definitions provided for these questions or that he is undecided on these questions. His demographics include: rural, male, 40-55, Caucasian, and 4-Year Degree.

Summary of the Implication of Confused, Contradictory, or Omitted Responses

There were 26 (39%) out of 66 board respondents submitted confusing, contradictory, or omitted responses. Most of these confusing responses dealt with questions 2-6 and may have affected the analysis of the statistics.

On the survey questions which were included in data analysis in this dissertation (questions 2, 3, 7, 8, and 13), there were many omitted or confused responses. A total 10 (15 %) of board members had conflicting responses on the questions 2 (YEC) and 3 (OEC): 8 subjects omitted the question on YEC; 7 omitted the question on OEC; two answered “Yes” to both OEC and YEC, which are mutually exclusive belief systems. Of mailed board members, 6 (.09) omitted question 7, permits creationism, and 3 (.045%) omitted question 8, requires creationism. The percentages of confused or conflicting responses on the targeted questions from respondents could have affected data analysis.

Speculation: Factors Affecting the Return Rate

However, if subjects were afraid to take a stance for creationism for fear of being monitored by the district, would they actually be willing to take speak out for creationism

in board meetings or vote for its inclusion? In short, would board members or superintendents actually take the action they purported they would in their survey responses?

Timing of Dissemination

The first survey was disseminated on October 29, 2006. Despite the hectic week of Halloween for school systems, this dissemination received the highest response rate. The final survey received from this dissemination from mailed board members arrived on December 16, 2006.

The second survey was disseminated on November 13, 2006 which was Monday of the week before Thanksgiving. The majority of the Georgia school districts had most of the following week off while some districts were closed for the entire week of November 20-24, 2006. The last survey from the second dissemination was received on December 18, 2006.

The following Monday after Thanksgiving, the final surveys were disseminated. Returned surveys for this dissemination were received through December 18, 2006.

Perhaps if the surveys were disseminated during a non-holiday period, response rates may have been a little higher. There is no way to be certain. However, it is possible that with the very nature of this survey centering on Christian religious beliefs, that the good will which is often prevalent in the Bible “belt” during the Thanksgiving and Christmas seasons actually tended to increased the response rate. Again, there is no way to be certain of either scenario.

Misunderstandings as to District Rules to Surveys

Some board members may have been confused about the district rules concerning completion of surveys not approved by the district. For example, a district coordinator was unwilling to even proofread the survey instrument let alone participate in the field test. The individual did not believe she was permitted to do so without the approval of the district research department (Anonymous, 2006).

Support of Evolution

Though no invitee stated so, it is possible that many of the invitees who support evolution and oppose the inclusion of creationism in science curriculum believed that the purpose of this research study was to support creationism in schools or was intended for use by the “Religious Right.” Perhaps they felt they would be supporting a conservative creationism platform by answering this survey at all.

Summary of Results

Board Members

Research Question 1

This research question stated, “What is the relationship between school board members’ personally held beliefs regarding creationism and the inclusion of creationism in the school district science curriculum?” This question was analyzed based on board members’ beliefs in either Young Earth Creationism or Old Earth Creationism and either the permitted inclusion or the required inclusion of creationism in district science curriculum.

Permitted inclusion of creationism. A weak, positive relationship between YEC beliefs and the permitted inclusion of creationism in the science curriculum of the district was indicated by data analysis. Moderately significant results, $\chi^2 (1) = 4.835, p = .028, \Phi$

= .291, $p = .028$, were noted in data analysis. However, it is noted that the numbers in some cells were low and that the data for continuity corrected chi square value was 3.561, $p = .059$. This may limit the importance which can be placed on the variable relationships.

Fewer than expected school board members who believed in OEC and more than expected school board members who did not believe in Old Earth creationism responded yes when asked if their school district permitted the inclusion of creationism in the school district science curriculum. A statistically significant, though moderate, negative relationship exists between school board members' OEC beliefs and permitting the inclusion in the science curriculum, $\chi^2(1) = 6.508$, $p = .011$, $\Phi = -.335$, $p = .011$. This suggests that board member beliefs which include OEC may be negatively associated with the districts' permitted inclusion of creationism in the district science curriculum.

Required inclusion of creationism. No relationship was noted between school board members' belief in YEC and the required inclusion of creationism in the district science curriculum. The observed significance level, .275, suggests that the required inclusion of creationism in the school district science curriculum may not depend on the Young Earth creationism beliefs of school board members.

No statistical association exists between school board members' Old Earth Creationism beliefs and the required inclusion in the science curriculum, $\chi^2(1) = .028$, $p = .867$. It was not found significant at the .05 level.

District Location

Research Question 2

Research Question 2 asked "Is school district location (rural, suburban, and urban) associated with the permitted inclusion of creationism in the school district

science curriculum?” The Chi Square Test of Independence was used to analyze the relationships.

Data analysis suggests that the permitted inclusion of creationism in the school district science curriculum may not depend on school district location. The observed significance level of .352 indicates that no relationship exists between variables.

Research Question 3

Research Question 3 asked “Is school district location (rural, suburban, and urban) associated with the required inclusion of creationism in the school district science curriculum?”

The findings suggest that the required inclusion of creationism in the school district science curriculum may not depend on school district location. The chi-square observed significance level of .349 indicates no relationship between the two variables.

Discussion of Results

A weak, positive relationship between school board members who report a belief in YEC and districts’ permission to include creationism in the science curriculum was noted. Forty-two (73.7%) board members did not report a belief in YEC while 19 (26.3%) did. Since belief in Young Earth Creationism did not receive the majority of responses, it is concluded that it is not the most commonly held belief in terms of the Christian view of creation among responding board members. Yet, the identified relationship strength was found to be weak between board member belief in YEC and the districts’ permitted inclusion of creationism in the science curriculum. These data findings suggest that districts which have board members who hold a belief in YEC are more likely to permit the inclusion of creationism in the district science curriculum.

However, this can not be construed as a cause and effect relationship. This data finding could be due to belief systems of the voting population of the district or voting decisions made by previous board members as well as other possibilities; the continuity significance is .059.

A moderate statistically significant negative relationship was found between school board members' belief in OEC and the districts' permission to include creationism in the science curriculum. Thirty-six (62%) board respondents reported believing in OEC while 22 (37.9%) reported that they did not. This indicates that a much greater percentage of responding board members report a belief in OEC. Because fewer than expected school board members who believed in Old Earth Creationism and more than expected school board members who did not believe in OEC responded yes when asked if the school district permitted the inclusion of creationism in the school district science curriculum, it seems that board members' beliefs in YEC is connected more strongly than beliefs in OEC with the district's inclusion of creationism in the science curriculum. The negative relationship between board members who hold a belief in OEC and the districts' permitted inclusion of creationism in district science curriculum suggests that board members who believe in OEC are less likely to hold office in a district which permits the inclusion of creationism.

It is suggested by these analyses that board members' views which include YEC tend to have an increased connection with the districts' permitting teachers to include creationism in the district science curriculum. However, this may also be a reflection of the districts' voters. Because board members in Georgia are elected by voters, the board members' views may be aligned with the voting public on the issue of science curriculum

and the inclusion of creationism, or the board members may be acting on the wishes of the voters in their districts. Additionally, from these surveys, there is no way to determine *when* the district permitted or require creationism in the district curriculum. This analysis does not indicate that the school board members whose districts permit creationism are the same board members who voted to permit its inclusion. It is entirely possible that creationism was permitted or even mandated before the current school board took office. It is also noted that the continuity corrected significance for the relationship between YEC beliefs and the inclusion of creationism is $p=.059$ which affects the value of assumptions which can be made from this data.

Also, there is the question of omitted or conflicting responses. 15% of the responding board members either omitted a response on questions 2 and 3 or responded yes to both. Concerning question 7 (permit creationism), 6 (.09%) omitted this question; concerning question 8 (requires creationism), 3 (.045%) omitted this question. Therefore, this may have affected the results of the data analysis.

There was no significant association between school board members' belief in either OEC or YEC and the districts' requirement to include creationism in the science curriculum. The literature review highlighted numerous incidents of court challenges to mandates to include creationism in school curriculum. The non-significance of this mandate compared to the significance found in the required inclusion of creationism may be due to the districts' efforts to avoid lawsuits.

The results of this study found similar results as Deckman (1999, 2002) and Tenneson (2001). Deckman (1999) surveyed candidates for school boards nationally. Deckman's study found that conservative Christian candidates who attended church

frequently were more likely to support the inclusion of Christian precepts in the district curriculum. Tenneson also found that conservative Christians are more likely to support the inclusion of Christian principles in public education. In this study, conservative Christian views were identified through YEC beliefs find reference to YEC being more conservative

In a study by Smith (1995) evaluating the influence of citizens' recommendations concerning religious issues in South Carolina. Smith found that school board policy on this issue may reflect an effort to placate these citizens rather than to actually implement a meaningful policy change.

According to an American School Board Journal poll of school board members, results found that 67% of responding school board members support the inclusion of creationism in the curriculum (Evolution and the polls, n.d.).

In recent years in Georgia (as noted in the literature review of Cobb County, Georgia), many districts as well as cities and counties have grappled with Christian religious issues. Cobb County has been in the news concerning the use of disclaimer stickers on science texts. Additionally, many counties or cities in Georgia have been taken to court concerning displays of the 10 Commandments. In 2007, the state legislature considered the voluntary inclusion of Bible classes in Georgia public schools; this inclusion would be a voluntary decision by school districts as well as students who choose to take the class. Perhaps the positive relationship between school board member beliefs and the permission to include creationism in the curriculum is a reflection of the pervasive belief systems in the general public. Considering the required inclusion of creationism, a desire to avoid court cases such as Cobb County has faced may be a factor

in district decisions to not require the inclusion of creationism. Perhaps the permission as opposed to the requirement to include creationism is an attempt to operate “under the radar” of entities such as the ACLU and anti-Christian organizations.

Limitations of the Study

The results of this study do not imply a cause and effect relationship. Only associations between the beliefs of school board members and superintendents or district location and the inclusion of creationism in district science curriculum were identified.

Recommendations for Future Study

It is difficult to predict whether non-responders would have answered the survey in the same way. However, the 45.83% response rate for surveys was acceptable. For this reason, when disseminating surveys on controversial issues or to invitees who are likely to receive a great deal of e-mail, the use of surveys disseminated through the U. S. Mail is recommended.

Several recommendations for future research were identified through this through this study. Some of these recommendations are applicable to surveys in general while others address the special needs of surveys with sensitive topics.

Methodology

Generally, the procedures for survey dissemination went quite well. However, there are changes that are recommended.

- The five-contact survey methodology utilized in this research should be used.
- It is recommended that the dissemination of surveys should be on a one-month dissemination interval schedule. This will allow for enough time for survey submission and reduce mailing costs.

- Anonymous postcards should be used in the final survey dissemination. This way, if a respondent completed one of the earlier surveys, multiple attempts on the final dissemination would have been recognizable (though excluding the multiple survey submissions from statistical analysis is possible only if the survey and the anonymous postcard would be included in the same envelope). Also, many subjects appeared to be genuinely attempting to help with the research. Several of those who submitted two surveys included the anonymous postcard or signed a letter, thereby making it possible to identify the survey as a second submission.
- A personal appeal was included in all cover letters. These appeals included stressing the plea for help, specifically that their participation was needed for a successful project. In fact, several respondents included notes indicating that they hoped the research would be successful.
- For final survey invitations, using registered mail is advisable if the cost is feasible. Phone calls may also be considered if the survey is not sensitive in nature and if all non-responders can be contacted by phone.

Recommendations

Because of the limitations of this study, a cause and effect relationship between subjects' beliefs in YEC or OEC and the districts' inclusion of creationism in district science curricula could not be ascertained. Therefore, future research should also center on a cause and effect relationship between school board members' beliefs in either YEC or OEC and the permission or the requirement to include creationism in the district science curriculum. Determining a cause and effect relationship would necessitate the use of appropriate research methodology, such as a qualitative study.

Considering the results of these surveys, it is recommended that this research be replicated in other states. Differences in results between Bible “belt” states and non-Bible “belt” states should be compared. Differences in results between “Red and Blue States” should also be compared because, since board members are elected, political issues should be considered.

It is further recommended that all surveys be disseminated via U.S. Mail which may, due to the high costs of a five-contact method, necessitate research funding.

Further studies should investigate the relationship between board members’ beliefs in YEC and OEC the districts’ requirement to include creationism in district science curricula in each state being researched. Additionally, superintendents’ beliefs on these topics should be studied, thereby comparing the relative influence of board members and superintendents. Only six board members indicated that their districts mandate the inclusion of creationism in the science curriculum. However, it may also be true that the six school board members who reported the district requirement for the inclusion of creationism were wrong about this particular curricular regulation. Some responding board members were evidently unclear as to district regulations on this topic because some responses were omitted or question marks were placed in the spaces for the answers. Therefore, a targeted study of districts which mandate creationism should include a verification of this requirement on the district level.

The primary focus of this study was the relationship between board members’ YEC and OEC beliefs and districts’ permitted or required inclusion of creationism in district science curricula. While the disseminated surveys included data on subjects’ beliefs in evolution, macroevolution, and microevolution, and demographic data, this

dissertation was only concerned with subjects' YEC and OEC beliefs. Future studies should also consider the connection between school board members' beliefs in evolution, macroevolution, and microevolution on the inclusion of creationism in district science curricula in each of the states studied. Demographics should also be studied to determine if there are any connections between them and the inclusion of creationism. The remaining data collected from these surveys should be analyzed.

Recommendations for the Voting Public on the Creationism Curricular Issue in Georgia

There is a weak, positive relationship between the school board members' beliefs concerning YEC and the permitted inclusion of creationism in district curricula. A moderate, negative relationship was identified between school board members' beliefs in OEC and the permitted inclusion of creationism in district science curricula. This indicates that the board members' beliefs on this issue have more of an association with the district science curriculum. Therefore, voters should consider these beliefs when voting for school board candidates; voters should consider selecting candidates, in part, based on whether candidate views align with their own.

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APPENDIX

Appendix A

Preletter for Board Members

October 27, 2006

Dear Educator:

In a few days, you will receive in the mail a request to answer a brief ANONYMOUS survey for a research study I am completing for my dissertation at Liberty University. This survey deals with the creationism/evolution issue in district science curriculums in Georgia. You were selected at random from a list of Georgia school board members.

The reason for this letter is that many people like to know ahead time that they will be contacted concerning a study. This research project will help us understand this issue as it relates to Georgia's public schools.

Please complete the survey AS SOON AS YOU RECEIVE it, and return it in the envelope provided! On a personal level, it is CRITICAL for me to have a high survey return rate. So I APPEAL to you to take the time to complete the survey. By completing the survey immediately, you will help me complete my study quickly and save me the enormous cost of resending the surveys!

Thank you for your time. Without the help of kind people like you, this study could not be successful.

Sincerely,
Karen Cook

Appendix B

Survey Questions for Local 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 C

Second Contact, Cover Letter, 1st Survey Invitation

October 30, 2006

Dear School Board Member:

I am writing this letter to APPEAL for your help with my study. I am an Ed. D. student at Liberty University. As a part of my study, I am surveying local school superintendents and randomly selected board members in Georgia.

This study investigates curriculum, attitudes, actions, and voting habits concerning evolution and creationism. The results of this study will help identify correlations, if any between worldviews and actions and voting habits among superintendents and school board members.

Attached, you will find a BRIEF survey. Answers are confidential. To insure confidentiality, you will find a stamped postcard enclosed. It has a number in the corner which matches your number on my database. When you complete your survey, please place it in the enclosed stamped envelope. Then, drop this envelope and the postcard in the mail. I will remove your name from my list of survey participants using the number on the postcard, but I will have no way of connecting your survey to the postcard or your name which assures your confidentiality.

On a personal level, it is CRITICAL for me to have a high survey return rate. So I appeal to you to take the time to complete the survey.

Naturally, this survey is voluntary, but completion of the survey is vital to the successful completion of my dissertation! If you have any questions, you may call me at 770 210-2104. I am available at this number after 4 p.m.

Thanks again for your help with my study!

Sincerely,
Karen Cook, ABD
Liberty University

Appendix D

Anonymous Postcard

Questionnaire #_____

By returning this postcard separately from your survey, your anonymity is assured. Just drop this post card in the mail!

Thank you for your help with my study!
Karen Cook, ABD
Liberty University

Appendix E

Thank You Reminder Card

November 1, 2006

Last week a questionnaire was sent to you concerning creationism and evolution. You were selected randomly to complete this anonymous survey.

If you have already returned the questionnaire, I want to thank you for your help with my project. Your responses will help us better understand these issues in Georgia public school curriculums.

On a personal level, it is CRITICAL for me to have a high survey return rate. So I appeal to you to take the time to complete the survey.

If you did not receive the questionnaire or can not find it, please call me at 770 210-2104. I will mail you a replacement.

Thanks for your help!
Karen Cook, ABD, Liberty University

Appendix F

Fourth Contact, 2nd Survey Invitation

November 13, 2006

Dear Board Member:

During the past several weeks, you have received several mailings concerning an important study on creationism/evolution in Georgia public schools. The purpose of this study is to learn more about the connection between beliefs and actions of board members and superintendents.

Those who have not yet responded to the survey may have differing views than those who have already completed the survey. Your responses will help make this survey as accurate as possible. Please complete the survey **AS SOON AS YOU RECEIVE** it, and return it in the envelope provided! On a personal level, it is **CRITICAL** for me to have a high survey return rate. So I **APPEAL** to you to take the time to complete the survey. By completing the survey immediately, you will help me complete my study quickly and save me the enormous cost of resending the surveys!

Attached, you will find a BRIEF survey. Answers are confidential. To insure confidentiality, you will find a stamped postcard enclosed. It has a number in the corner which matches your number on my database. When you complete your survey, please place it in the enclosed stamped envelope. Then, drop this envelope and the postcard in the mail. I will remove your name from my list of survey participants using the number on the postcard, but I will have no way of connecting your survey to the postcard or your name which assures your confidentiality.

If you have already completed the survey, I want to sincerely thank you for all of your help. Your responses help us understand the creationism/evolution issue in Georgia science curriculums. No further action is needed on your part. *If you have already completed this survey, I want to thank you sincerely for your help with my study. Please do not take the survey again if you have already completed it.*

Naturally, this survey is voluntary, but completion of the survey is vital to the successful completion of my dissertation! If you have any questions, you may call me at 770 210-2104. I am available at this number after 4 p.m.

Thanks again for your help with my study!

Sincerely,
Karen Cook, ABD
Liberty University

Appendix G

Final Survey Invitation Letter

November 27, 2006

Dear Educator:

During the past several weeks, you have received several mailings concerning an important study on creationism/evolution in Georgia public schools. The purpose of this study is to learn more about the connection between worldviews and actions of board members and superintendents.

The study is nearing completion, and this is the last invitation that you will be given to participate in the survey for this study. Those who have not yet responded to the survey may have differing views than those who have already completed the survey. Your responses will help make this survey as accurate as possible.

Attached, you will find a BRIEF survey. Answers are confidential. When you complete your survey, please place it in the enclosed stamped envelope. Then, drop this envelope in the mail.

On a personal level, it is **CRITICAL** for me to have a high survey return rate. So I appeal to you to take the time to complete the survey.

Please be assured that this survey is completely voluntary and anonymous.

Your participation will be greatly appreciated.

Sincerely,
Karen Cook

Appendix H

SPSS Charts for Hypothesis 1, YEC and the Permitted Inclusion of Creationism

Case Processing Summary^a

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

a. 1=mailed, 0=emailed = 0

0=no, 1=yes, permits creationism * 0=no, 1=yes, YEC Crosstabulation

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

Count			
% within	73.7%	26.3%	100.0%
0=no,			
1=yes,			
permits			
creationis			
m			
% within	100.0%	100.0%	100.0%
0=no,			
1=yes,			
YEC			
% 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	4.750	1	.029		
Associatio n					
N of Valid Cases	57				

a Computed only for a 2x2 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 I

SPSS Charts for Hypothesis 2, OEC and the Permitted Inclusion of Creationism

Case Processing Summary

	Cases		Missing		Total	
	Valid	Percent	N	Percent	N	Percent
0=no, 1=yes, OEC *	58	87.9%	8	12.1%	66	100.0%
0=no, 1=yes, permits creationis m						
a 1=mailed, 0=emailed = 0						

0=no, 1=yes, OEC * 0=no, 1=yes, permits creationism Crosstabulation

		0=no, 1=yes, permits creationis m		Total
		0	1	
0=no, 1=yes, OEC	0	Count	1	12
		Expected	4.9	8.1
		Count		13.0
		% within	7.7%	92.3%
		0=no, 1=yes, OEC		100.0%
1	0	% within	4.5%	33.3%
		0=no, 1=yes, permits creationis m		22.4%
		% of Total	1.7%	20.7%
		Count	21	24
		Expected	17.1	27.9
	1	Count		45
		Expected	17.1	27.9
		Count		45.0
		% within	46.7%	53.3%
		0=no, 1=yes, OEC		100.0%
		% within	95.5%	66.7%
		0=no, 1=yes, permits creationis m		77.6%
		% of Total	36.2%	41.4%

Total	Count	22	36	58
	Expected	22.0	36.0	58.0
	Count			
	% within	37.9%	62.1%	100.0%
	0=no, 1=yes, OEC			
	% within	100.0%	100.0%	100.0%
	0=no, 1=yes, permits creationis m			
	% of Total	37.9%	62.1%	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	6.508	1	.011		
Chi-Square					
Continuity	4.957	1	.026		
Correction					
Likelihood	7.758	1	.005		
Ratio					
Fisher's				.011	.009
Exact Test					
Linear-by-Linear	6.395	1	.011		
Association					
n					
N of Valid Cases	58				

a Computed only for a 2x2 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 J

SPSS Charts for Hypothesis 3, YEC and the Required Inclusion of Creationism

Case Processing Summary

	Cases		Missing		Total	
	Valid	Percent	N	Percent	N	Percent
0=no, 1=yes, requires creationis m * 0=no, 1=yes, YEC a 1=mailed, 0=emailed = 0	60	90.9%	6	9.1%	66	100.0%

0=no, 1=yes, requires creationism * 0=no, 1=yes, YEC Crosstabulation

		0=no, 1=yes, YEC		Total
		0	1	
0=no, 1=yes, requires creationis m	0	Count 42	14	56
	Expected Count	41.1	14.9	56.0
	% within 0=no, 1=yes, requires creationis m	75.0%	25.0%	100.0%
	% within 0=no, 1=yes, YEC	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 creationis m	50.0%	50.0%	100.0%
	% within 0=no, 1=yes, YEC	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 creationis m	73.3%	26.7%	100.0%
% within 0=no, 1=yes, YEC	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 2x2 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		Missing		Total	
	N	Percent	N	Percent	N	Percent
0=no, 1=yes, requires creationis m * 0=no, 1=yes, YEC	35	92.1%	3	7.9%	38	100.0%

a 1=mailed, 0=emailed = 1

Appendix K

SPSS Charts for Hypothesis 4, OEC and the Required Inclusion of Creationism

Case Processing Summary

	Cases		Missing		Total	
	Valid	Percent	N	Percent	N	Percent
0=no, 1=yes, requires creationis m * 0=no, 1=yes, OEC	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, OEC Crosstabulation

		0=no, 1=yes, OEC		Total
		0	1	
0=no, 1=yes, requires creationis m	0	Count 12	44	56
	Expected Count	12.1	43.9	56.0
	% within 0=no, 1=yes, requires creationis m	21.4%	78.6%	100.0%
	% within 0=no, 1=yes, OEC	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 creationis m	25.0%	75.0%	100.0%
	% within 0=no, 1=yes, OEC	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 creationis m	21.7%	78.3%	100.0%
% within 0=no, 1=yes, OEC	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 Associatio n	.028	1	.868		
N of Valid Cases	60				

a Computed only for a 2x2 table

b 2 cells (50.0%) have expected count less than 5. The minimum expected count is .87.

c 1=mailed, 0=emailed = 0

Appendix L

SPSS Charts for Hypothesis 5, District Location and the Permitted Inclusion of

Creationism

Case Processing Summary

	Cases		Missing		Total	
	Valid	Percent	N	Percent	N	Percent
0=no, 1=yes, permits creationis m * 1= suburban, 2=rural, 3=urban	59	89.4%	7	10.6%	66	100.0%

a 1=mailed, 0=emailed = 0

0=no, 1=yes, permits creationism * 1= suburban, 2=rural, 3=urban Crosstabulation

		1= suburban, 2=rural, 3=urban			Total	
0=no, 1=yes, permits creationis m	0	Count	1 3	2 16	3 2	21
		Expected Count	2.1	17.8	1.1	21.0
		% within 0=no, 1=yes, permits creationis m	14.3%	76.2%	9.5%	100.0%
		% within 1= suburban, 2=rural, 3=urban	50.0%	32.0%	66.7%	35.6%
		% of Total	5.1%	27.1%	3.4%	35.6%
	1	Count	3	34	1	38
		Expected Count	3.9	32.2	1.9	38.0
		% within 0=no, 1=yes, permits creationis m	7.9%	89.5%	2.6%	100.0%
		% within 1= suburban, 2=rural, 3=urban	50.0%	68.0%	33.3%	64.4%

Total	suburban, 2=rural, 3=urban				
	% of Total	5.1%	57.6%	1.7%	64.4%
	Count	6	50	3	59
	Expected	6.0	50.0	3.0	59.0
	Count				
	% within	10.2%	84.7%	5.1%	100.0%
	0=no, 1=yes, permits creationis m				
	% within	100.0%	100.0%	100.0%	100.0%
	1=				
	suburban, 2=rural, 3=urban				
	% of Total	10.2%	84.7%	5.1%	100.0%

a 1=mailed, 0=emailed = 0

Chi-Square Tests

	Value	df	Asymp. Sig. (2- sided)
Pearson	2.088	2	.352
Chi-Square			
Likelihood	1.999	2	.368
Ratio			
Linear-by-Linear	.002	1	.962
Association			
n			
N of Valid	59		
Cases			

a 4 cells (66.7%) have expected count less than 5. The minimum expected count is 1.07.

b 1=mailed, 0=emailed = 0

Symmetric Measures

		Value	Approx. Sig.
Nominal	Phi	.188	.352
by			
Nominal			
	Cramer's V	.188	.352
N of Valid		59	
Cases			

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

c 1=mailed, 0=emailed = 0

Appendix M

SPSS Charts for Hypothesis 6, District Location and the Required Inclusion of

Creationism

Case Processing Summary

	Cases		Missing		Total	
	Valid N	Percent	N	Percent	N	Percent
0=no, 1=yes, requires creationis m * 1= suburban, 2=rural, 3=urban a 1=mailed, 0=emailed = 0	62	93.9%	4	6.1%	66	100.0%

0=no, 1=yes, requires creationism * 1= suburban, 2=rural, 3=urban Crosstabulation

		1= suburban, 2=rural, 3=urban			Total	
0=no, 1=yes, requires creationis m	0	Count	1 5	2 51	3 3	59
		Expected Count	5.7	50.4	2.9	59.0
		% within 0=no, 1=yes, requires creationis m	8.5%	86.4%	5.1%	100.0%
		% within 1= suburban, 2=rural, 3=urban	83.3%	96.2%	100.0%	95.2%
		% of Total	8.1%	82.3%	4.8%	95.2%
1		Count	1	2	0	3
		Expected Count	.3	2.6	.1	3.0
		% within 0=no, 1=yes, requires creationis m	33.3%	66.7%	.0%	100.0%

Total	% within	16.7%	3.8%	.0%	4.8%
	1=				
	suburban,				
	2=rural,				
	3=urban				
	% of Total	1.6%	3.2%	.0%	4.8%
Total	Count	6	53	3	62
	Expected	6.0	53.0	3.0	62.0
	Count				
	% within	9.7%	85.5%	4.8%	100.0%
	0=no,				
	1=yes,				
	requires				
	creationis				
	m				
	% within	100.0%	100.0%	100.0%	100.0%
	1=				
	suburban,				
	2=rural,				
	3=urban				
	% of Total	9.7%	85.5%	4.8%	100.0%

a 1=mailed, 0=emailed = 0

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.184	.349
	Cramer's V	.184	.349
N of Valid Cases		62	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

c 1=mailed, 0=emailed = 0